ORDER NO. VKD82100662C8

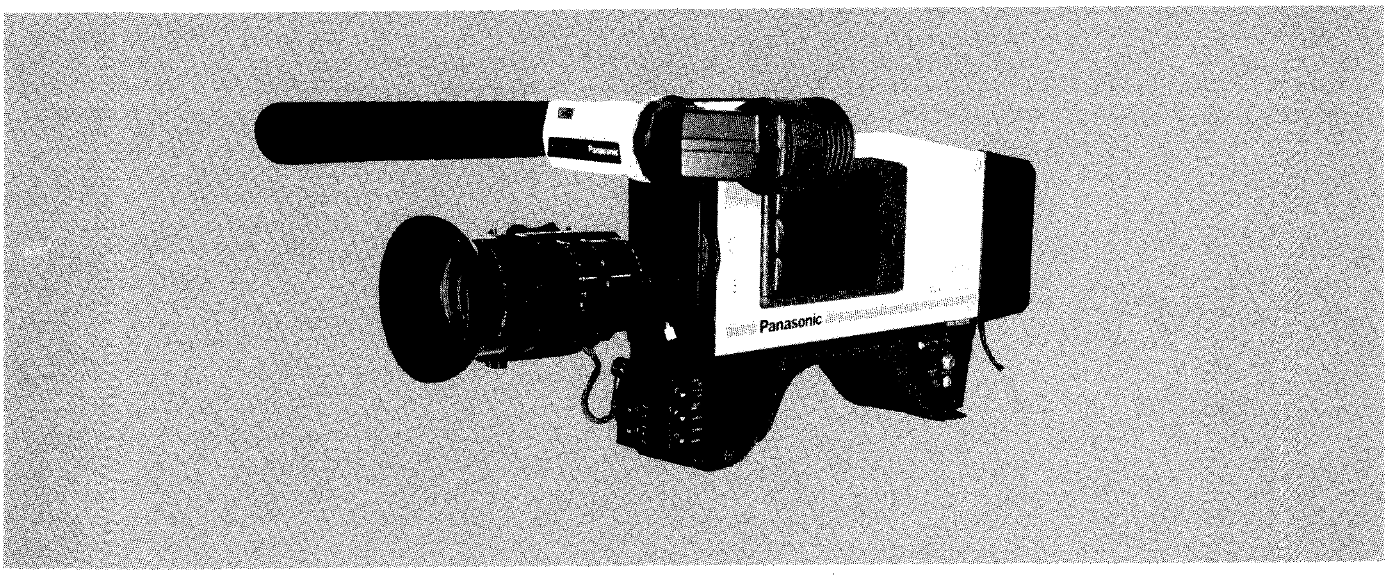
Service Manual

Vol. 1

Circuit Description

Colour Video Camera

WV-777 Series



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Panasonic

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P.O. Box 288, Central Osaka Japan

CIRCUIT DESCRIPTION FOR WV-777

1. Outline

Incoming light which contains red (R), green (G) and blue (B) light enters a dichroic prism through a zoom lens and separated into the R, G and B light respectively. The separated R, G and B light go to the respective pick-up tubes and converted into the video signal whose level corresponds to the incoming light intensity. The video signals from the pick-up tubes are then sent to the Pre-preamplifier and Preamplifier circuit and the video signals are amplified to the necessary level.

The amplified R, G and B signals are supplied to the dark shading correction circuit where their dark shading is corrected and the gain of R, G and B signal is controlled by setting the High Gain Selection Switch. In the dark shading correction circuit in the Process-1 board, the gain and pedestal level of R and B signal are controlled automatically by the DC voltages from the Auto board to match them with those of G signal. In this way, the white balance and black balance are set automatically.

The R, G and B signals from the Process-1 board are fed to the signal processing circuit in the Process-2 board, where these signals undergo the gamma correction to correct non-linear photoelectric conversion characteristic of cathode ray tube (CRT) and to produce a linear picture of high fidelity. These signals also receive low level clip for setting the pedestal level and high level clip to clip excessively high level. The G signal from the G signal processing circuit is fed to the vertical (V) detail signal generator and the horizontal (H) detail signal generator. The H detail signal and V detail signal thus generated are mixed together, fed through the detail control circuit to R, G and B signal processing circuit, and added to the R, G and B signal to enhance the horizontal and vertical resolution. The R, G and B signals from the signal processing circuit are fed to R/G/B comparator for automatic white and black balance setting.

The R, G and B signals are then supplied to the chroma encoding circuit where these signals are modulated by the subcarrier signal from the subcarrier signal circuit and a chrominance signal is generated. When the Color Bar/Camera Selection Switch is set to the BAR position, the R, G and B color bar signals are sent to the chroma encoding circuit from the color bar circuit and a chrominance signal for color bar is generated. The burst flag pulse (BFP) is fed to the chroma encoding circuit to make burst signal. The chrominance signal generated in this way is then applied through the chroma amp circuit to the PAL out circuit where the chrominance signal is mixed with the luminance signal and sync signal to make a composite PAL signal. The PAL signal is sent to other system product through a video output connector.

The R, G and B signals from the signal processing circuit and the PAL signal from the PAL out circuit are fed to the PIX output circuit. In the PIX output circuit, R-G or B-G signal is selected for the registration adjustment and sent to the PIX output connector.

In the R/G/B comparator circuit, the R and B signal are compared with the G signal respectively and the resultant level in comparison is fed to the respective automatic white control and automatic black control circuit. On the other hand, the ABC/AWC inhibit circuit sends clock pulses to the automatic white and black control circuit for approximately 5 seconds after the Auto White/Auto Black Set Switch is set. During 5 seconds, the counter in the automatic white and black control circuit counts up or down depending upon the resultant level in R/G/B comparison and the digital signals are converted into the analog signals (DC voltage). They are supplied to the R and B dark shading correction/gain control circuit for setting the gain and pedestal of R and B signal to match those for the G signal automatically. In this way, the automatic white and black balance is accomplished. The color conversion warning/backup control circuit flashes the color conversion warning indicator during the automatic setting and lights it when the automatic white balance setting is failed. This circuit also supplies the backup power to the automatic white/black control circuit after turning OFF the power switch to hold the white and black balance previously set.

8.86 MHz frequency oscillated by the 8.86 MHz oscillator circuit is fed to the sync generator circuit. In the sync generator circuit, the 8.86 MHz signal is compared in phase with the signal oscillated by the internal 2.5 MHz oscillator circuit. The phase-difference is converted into DC voltage and sent back to the internal 2.5 MHz oscillator circuit to control 2.5 MHz frequency. As a result, the 2.5 MHz signal is phase-locked with the 8.86 MHz signal by this phase lock loop (PLL) circuit and the PAL sync pulses are generated from the sync generator circuit. The sync generator circuit generates subcarrier (SC) signal, horizontal drive (HD) pulse, vertical scanning start (Vs) pulse, blanking (BL) pulse, encoder BL pulse, pre BL pulse, sync pulse, burst flag pulse (BFP) and clamp pulse, and sends them to other circuits. The SC signal is fed to the chroma encoding circuit through the subcarrier circuits.

The black burst signal which contains the burst and sync signal and supplied to the GEN-LOCK connector is fed to the sync separation circuit where the sync signal is separated. The separated sync signal is sent to the gen-lock 2.5 MHz oscillator circuit through the gen-lock H phase circuit and 8.86 MHz oscillator, sync generator and internal 2.5 MHz oscillator circuit through the gen-lock detection circuit. The separated sync is also fed to the burst gate pulse and V separation circuit. When the sync signal is detected in the gen-lock detection circuit, the low level is fed to the related circuits and the 8.86 MHz oscillation stops and the camera becomes the gen-lock/external sync mode. The gen-lock signal is sent from the sync separation circuit to the burst gate circuit where only the burst signal is gated by the burst gate pulse. The gated burst signal is then sent to the gen-lock/external SC circuit which generates the subcarrier (SC) signal whose frequency and phase are same as the gated burst signal. The SC signal thus generated is then sent to the chroma encoding circuit through the subcarrier circuits. The horizontal drive (HD) pulse generated in the sync generator circuit and the separated sync signal are sent to the gen-lock 2.5 MHz oscillator circuit. In this circuit, the both signals are compared in phase and phase difference is converted into the DC voltage to control the oscillating frequency. The oscillated 2.5 MHz is fed to the sync generator circuit. In this way, a phase lock loop (PLL) circuit is made and the sync generator is locked by the gen-lock signal horizontally. The gated burst signal is sent to the field detect circuit. In this circuit, the 4th field is detected by use of the burst gate and vertical (V) pulse made the separated sync signal. The detected pulse corresponding to the 4th field is sent to the V reset pulse circuit. The V reset pulse is sent to the sync generator circuit to reset it vertically. The +9V DC regulator circuit produces the regulated +9V DC from the +12V DC supplied from the AC adaptor or battery pack. +9V DC is used as a power source.

The battery warning circuit flashes the Battery Warning Indicator in the 1.5 inch viewfinder when the DC voltage from the battery pack becomes below the specified level.

The horizontal deflection circuit generates the sawtooth current from the HD pulse for the horizontal(H) beam deflection inside the pick-up tubes and sends to the H deflection coils for the R, G and B pick-up tubes. The flyback pulse generated in the horizontal deflection circuit is converted into parabola signals in the horizontal linearity circuit and these signals are also fed to the H deflection coil for the linear H beam deflection. The vertical scanning start(Vs) pulse is supplied to the V sawtooth generator circuit and converted into a vertical(V) sawtooth signal. The V sawtooth signal is then fed to the vertical deflection circuit and vertical linearity circuit. The V sawtooth signal is converted into a V parabola signal in the vertical linearity circuit and fed to the vertical deflection circuit too. In the vertical deflection circuit, the V sawtooth signal for V deflection and V parabola signal for V linearity correction are mixed and amplified. The mixed signal is then sent to the V deflection coil for the R, G and B pick-up tubes. The skew circuit sends the V sawtooth signal to the horizontal deflection circuit through the centering/skew output circuit together with centering DC voltages for the registration among the R, G and B pick-up tubes. Alignment circuit sends the constant DC current to the H and V alignment coils in the R, G and B coil assembly for bending the electron beam in the pick-up tubes. As a result, the electron beam in the center of deflection reachs the photoconductive layer (which converts the light to the video signal) perpendicularly and the resolution at the center of picture becomes best. The H & V detection circuit receives the H deflection and V deflection signal and converts into the DC potential. The DC potential is sent to the high voltage circuit in the High voltage board for the target protection of pick-up tubes.

The dark shading signal circuit generates the mixed signal of H and V sawtooth and parabola signal and sends it to the R, G and B dark shading correction/gain control circuit for the dark shading correction. The centering select circuit selects that whether the H and V centering adjustment is made in the camera or from the remote control unit (RCU).

The high voltage circuit generates the DC voltages for the pick-up tubes using a DC-DC converter and supplies them to the electrodes of R, G and B pick-up tubes. The DC potential is fed to the high voltage circuit from the H & V detection circuit for the target protection. In the normal operating condition, the high potential is fed to the high voltage circuit and the high voltages are generated. However, the H or/and V deflection circuit fails, the low level is fed to the high voltage circuit and it stops generating the high voltages. In this way, the target of pick-up tubes are protected. The feedback beam control circuit receives the R, G and B signals from the R, G and B dark shading correction/gain control circuit respectively. The R, G and B signals are positively fed back to the grid-1(G1) of related pick-up tube for setting the beam current to optimum level automatically corresponding to the intensity of the scene. The -9V DC regulator circuit produces the -9V DC by regulating the -12V generated in the high voltage circuit. The horizontal drive (HD) pulse and the vertical scanning start(Vs) pulse are fed to the cathode blanking circuit where they are mixed and the composite cathode blanking pulse is made. It is then fed to the cathode of R, G and B pick-up tubes.

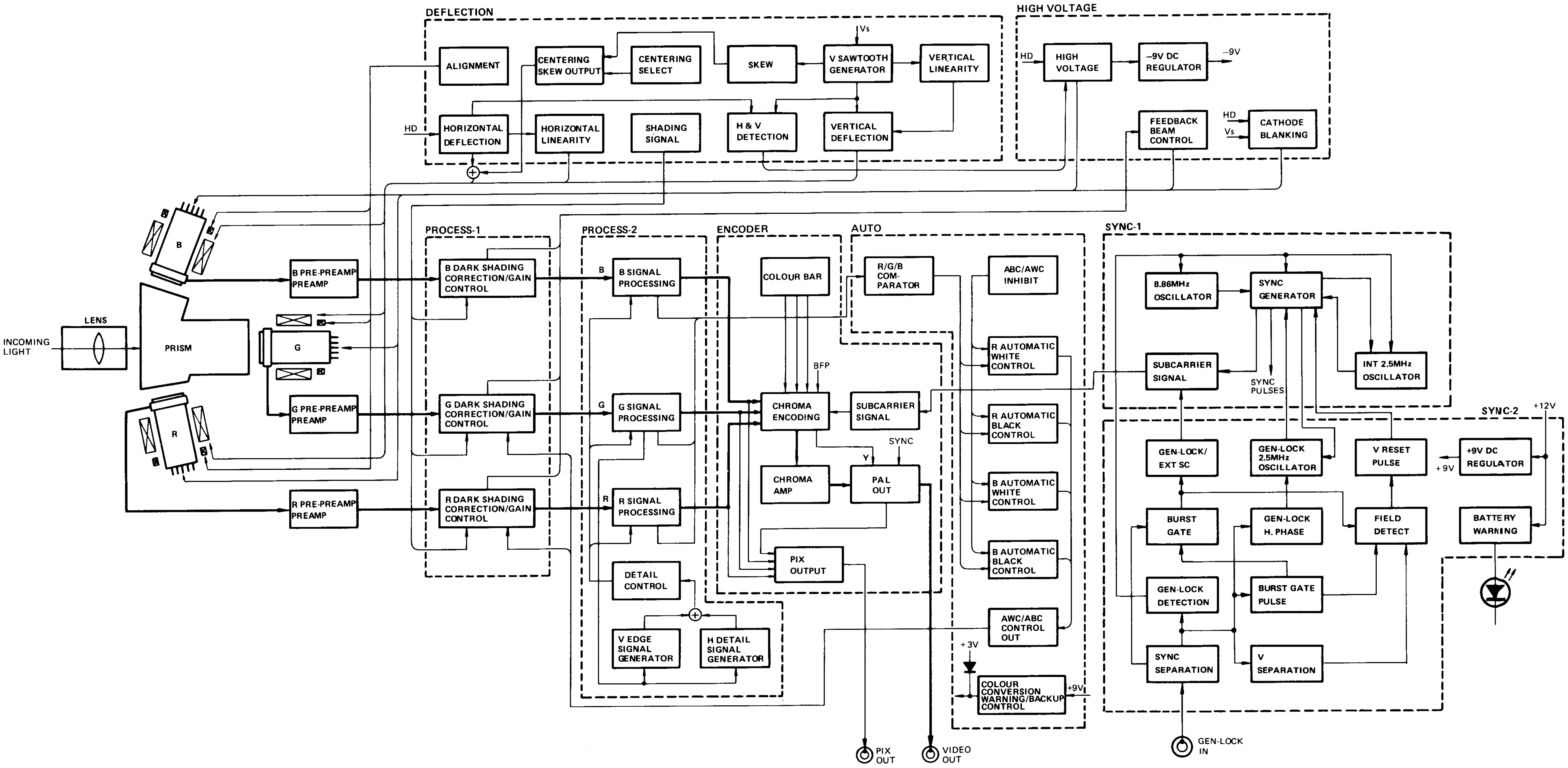
DEFLECTION
ALIGNMENT
CENTERING SKEW OUTPUT
CENTERING SELECT
SKEW
Vs
V SAWTOOTH GENERATOR
VERTICAL LINEARITY
HD
HORIZONTAL DEFLECTION
HORIZONTAL LINEARITY
SHADING SIGNAL
H & V DETECTION
VERTICAL DEFLECTION
HIGH VOLTAGE
HD
HIGH VOLTAGE
–9V DC REGULATOR
–9V
FEEDBACK BEAM CONTROL
HD
Vs
CATHODE BLANKING
INCOMING LIGHT
LENS
PRISM
B
G
R
B PRE-PREAMP PREAMP
G PRE-PREAMP PREAMP
R PRE-PREAMP PREAMP
PROCESS-1
B DARK SHADING CORRECTION/GAIN CONTROL
G DARK SHADING CORRECTION/GAIN CONTROL
R DARK SHADING CORRECTION/GAIN CONTROL
PROCESS-2
B
B SIGNAL PROCESSING
G
G SIGNAL PROCESSING
R
R SIGNAL PROCESSING
DETAIL CONTROL
V EDGE SIGNAL GENERATOR
H DETAIL SIGNAL GENERATOR
ENCODER
COLOUR BAR
BFP
CHROMA ENCODING
SUBCARRIER SIGNAL
SYNC
Y
CHROMA AMP
PAL OUT
PIX OUTPUT
PIX OUT
VIDEO OUT
AUTO
R/G/B COM-PARATOR
ABC/AWC INHIBIT
R AUTOMATIC WHITE CONTROL
R AUTOMATIC BLACK CONTROL
B AUTOMATIC WHITE CONTROL
B AUTOMATIC BLACK CONTROL
AWC/ABC CONTROL OUT
+3V
COLOUR CONVERSION WARNING/BACKUP CONTROL
+9V
SYNC-1
8.86MHz OSCILLATOR
SYNC GENERATOR
SUBCARRIER SIGNAL
SYNC PULSES
INT 2.5MHz OSCILLATOR
SYNC-2
+12V
GEN-LOCK/ EXT SC
GEN-LOCK 2.5MHz OSCILLATOR
V RESET PULSE
+9V
+9V DC REGULATOR
BURST GATE
GEN-LOCK H. PHASE
FIELD DETECT
BATTERY WARNING
GEN-LOCK DETECTION
BURST GATE PULSE
SYNC SEPARATION
V SEPARATION
GEN-LOCK IN

Fig. 1-1 Outline of WV-777

2. Optics System

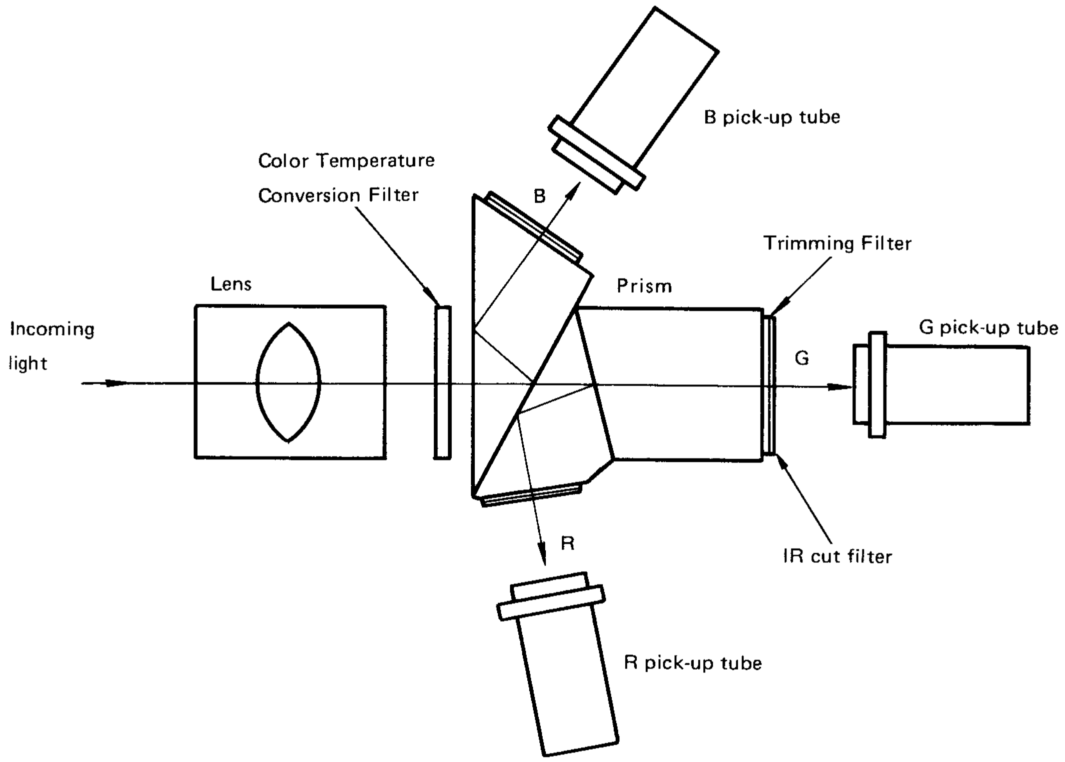

Fig. 2-1 Optics System

Outline

The optics system using a dichroic prism separates the incoming light into three primary color lights, red, green and blue. The separated light enters corresponding pick-up tube respectively to convert it into the video signal.

Details

The incoming light which contains the red (R), green (G) and blue (B) information enters the dichroic prism through a zoom lens and a color temperature conversion filter.

- **Color Temperature Conversion Filter**

Generally, the human eye is sensitive to electromagnetic waves from 380 mμ (mμ=nm) to 780 mμ in wavelength (the visible region). In addition, the eye also discerns the wavelength difference as a color difference, seeing light between 400 mμ to 500 mμ wavelength as predominantly blue information, the light between 500 mμ to 600 mμ as green information, and the light between 600 mμ to 700 mμ as red information. The entire light in the visible range of wavelength from 380 mμ to 780 mμ is seen as different amount of white light.

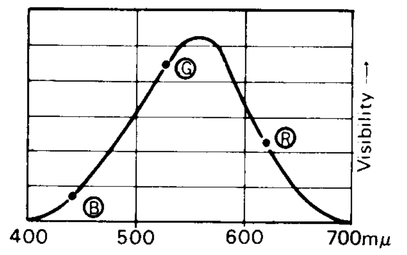

Fig. 2-2 Standard Luminosity Curve

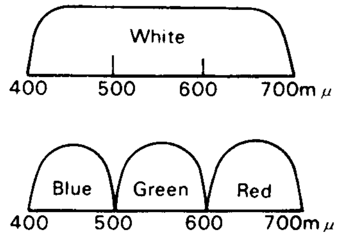

Fig. 2-3 The Visible Spectrum

When a carbon is burned, it emits light of a different quality depending on how hot it is. Various natural light can be expressed in terms of a color temperature which may be referred to a light emitted from the burning carbon used as a standard. A light source of 3200°K (K=Kelvin: −273°C corresponds to 0°K an absolute temperature) color temperature, which is used in studios, implies that its quality (color) is the same as that emitted from the carbon burning at 3200°K (2927°C). The relationship between the color temperature of light sources used for illumination and weather conditions are shown in Fig. 2-4. The color temperature goes up as the weather turns rainy from clear. This may be related to the burning carbon (charcoal) as follows. When the charcoal is heated and begins to glow (at low temperature), it emits a reddish light. But when it is so-called white hot (at high temperature), a bluish light is emitted. In other words, the light at a low color temperature is considered reddish and at high color temperature is considered bluish.

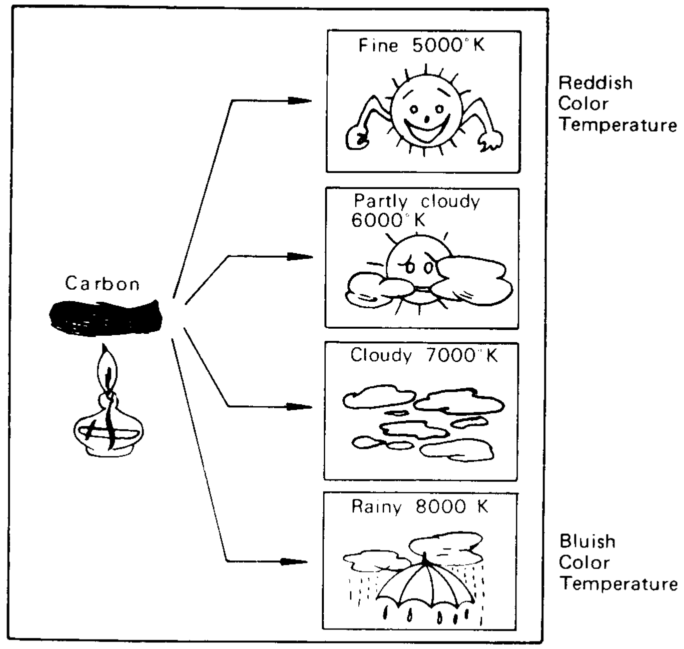

Fig. 2-4 Color Temperature and Weather Conditions

When a color camera is pointed at an object illuminated by a light of low color temperature, it reproduces a reddish picture. When the color camera is pointed at an object illuminated by a light of high color temperature, it produces a bluish picture. This camera is designed to be used under the light whose color temperature is 3200°K, and it has the 4-position color temperature conversion filter wheel which converts the color temperature of incoming light to 3200°K. When the filter wheel is set to the position 1, the transparent filter is inserted into the light path. When it is set to the position 2, the 5600°K color temperature conversion filter is inserted into the light path and the 5600°K light is converted to the 3200°K light. When it is set to position 3, the 5600°K color temperature conversion filter with 1/8 neutral density (ND) filter is inserted into the light path and the 5600°K light is converted to the 3200°K light. The position 3 is used for fine day outdoor. The position 4 is for closing the lens. In addition to the color temperature conversion filter wheel, this camera is so designed that the level of red and blue signals can be set automatically or manually to match the color temperature of the light source which illuminates the object in order to ensure proper color reproduction.

The blue (B) light is reflected at the boundary face between the 1st and 2nd prism and the surface of 1st prism, and enters the B pick-up tube through the trimming filter and infrared (IR) cut filter. The red (R) and green (G) lights pass through the boundary between 1st and 2nd prism.

- **Trimming Filter**

The boundary face of prism also reflects a little red and green light, not only blue light. The trimming filter passes only the blue light and prevents the red and green light going to the blue pick-up tube.

- **Infrared (IR) Cut Filter**

As shown in Fig. 1-5, the pick-up tube has some sensitivity in the infrared region beyond the visible range. The infrared (IR) cut filter cuts off the infrared light rays which the human eye does not see as light. If the color signal is made by using the video signal corresponding to the infrared rays which the human eye can not normally see, the colors of pictures on the monitor and that seen with the naked eye would differ substantially.

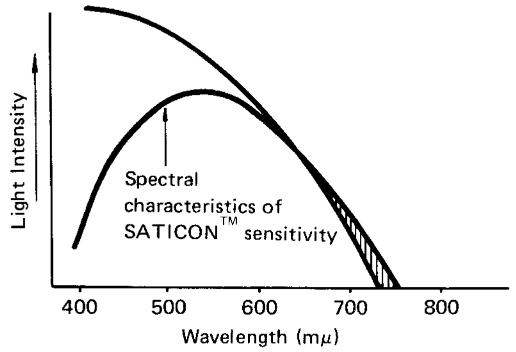

Fig. 2-5 IR Cut Filter Response

- **Pick-up Tube**

The 2/3" SATICON™ tubes are used in this camera as pick-up tubes. The SATICON™ tube has following features in comparison with the vidicon tube.

1. Higher sensitivity
2. Higher resistance against burning
3. Less lag
4. Less dark current/shading

The red(R) and green (G) lights reach on the boundary between the 2nd and 3rd prism and only the R light reflects. The reflected R light is again reflected by the boundary between the 1st and 2nd prism, and enters the R pick-up tube through the trimming filter and the IR cut filter as in the case of the B light.
The remaining green (G) light which passes through the boundary between the 2nd and 3rd prism goes to the G pick-up tube through the trimming filter and the IR cut filter as in the case of the B and G lights.

3. Pre-Preamplifier and Preamplifier Board

Outline

This circuits amplify the video signal of 0.2 μA from the pick-up tube to an usable video signal level of about 0.2V. This video signal is sent to the Process-1 board. Same Pre-preamplifier and Preamplifier board are used for amplifying the green, red and blue video signals.

Details

The video current from the green (G) pick-up tube is supplied to the target terminal of the Pre-preamplifier board and converted into a video signal by R1. This video signal is amplified by Q1 and fed to the Pre-amplifier board. The signal from the Pre-preamplifier board is amplified by Q1 and IC1 in the Preamplifier board and sent to the G dark shading correction/gain control circuit in the Process-1 circuit board through terminal 2 of CN12. The negative feedback signal is taken from pin 1 of IC1 and returned to the gate of Q1 in Pre-preamplifier board through the feedback circuit consisting of R5, C3 and R2. CT1 (FREQUENCY RESPONSE) adjusts the frequency response of the feedback signal and corrects the overall frequency response of the amplifier. The target voltage is supplied through terminal 6 of CN12 and R1 to the target of pick-up tube. The red and blue signals from the corresponding pick-up tube are amplified and sent to the Process-1 board as in the case of the green signal.

4. Process-1 Board

The Process-1 board contains following circuits.

Page
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4-2 G Shading Correction/Gain Control Circuit 7
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4-4 B Shading Correction/Gain Control Circuit 10

4-1 +3V/+4.5V DC Regulator Circuit

Outline

+3V and +4.5V DC are produced by regulating +9V DC supplied from the Sync-2 board. The +3V DC is fed to other boards and the +4.5V DC is used in this board.

Details

The +3V and +4.5V DC are generated by regulating +9V DC power with IC2. The reference voltage for +3V DC is obtained by dividing the +9V DC using R31 and R32. The output voltage at pin 7 of IC2 is fed back to pin 6 of IC2 for stabilizing the +3V DC. The +3V DC is supplied to other boards through pin 19 of CN2. The reference voltage for +4.5V DC is obtained by dividing the +9V DC using R70 and R71 and the output at pin 1 of IC2 is fed back to pin 2 for stabilizing the +4.5V DC. The +4.5V DC is supplied to the R and B shading correction/gain control circuit as reference voltage.

4-2 G Shading Correction/Gain Control Circuit

This circuit consists of the dark shading correction circuit, gain control circuit and pedestal setting circuit.

4-2-1 Dark Shading Correction Circuit

Outline

The pick-up tube produces dark current when the light is blocked by capping the lens for example. The dark current of pick-up tube is extremely small comparing with vidicon. Therefore, when the camera is aimed at the dark scene, potential at the photoconductive (target) layer of pick-up tube becomes lower than that of vidicon and the electron beam becomes insufficient to discharge the target. As a result, the beam does not respond to the variation of incoming light intensity to the pick-up tube and lag increases. (When a moving object is shot, or when the camera is panned, a trailing image is exhibited. This trailing image is called lag.)
In order to minimize the lag, bias lamp is positioned in front of the dichroic prism for increasing the light intensity reaches the pick-up tube. But the light intensity from the bias lamp is not uniform in actual scanning area.

The dark shading correction circuit equalizes the output of the pick-up tube uniformly. The dark shading correction signal is supplied from the Deflection board.

Details

The green(G) signal Ⓐ is supplied to the amp/shading correction circuit in IC1 through pin 4 of CN2 and VR1 (G INPUT GAIN). The dark shading correction signal Ⓑ from the dark shading signal circuit in the Deflection board is sent through pin 7 of CN2 to the amp/shading correction circuit. In the amp/shading correction circuit, the signal Ⓑ is added with the G signal for correcting the dark shading (Ⓒ).

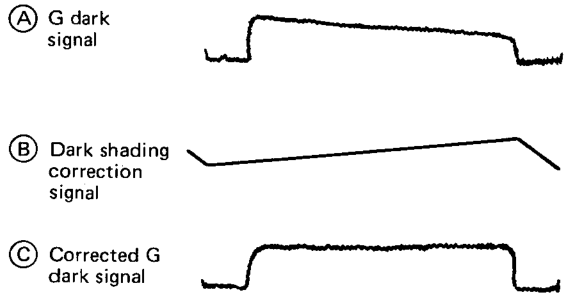

Fig. 4-2-1 Dark Shading Correction

The negative horizontal drive (HD) pulse is fed to blanking cleaner Q2 through inverter Q1 to eliminate the noise during the blanking period. The corrected G signal is sent through buffer Q3 to the clamp/white clip circuit where the G signal is clamped by the clamp pulse (CP) supplied through pin 7 of IC1 and the excessive high level of G signal is clipped. The G signal at pin 13 of IC1 is then fed to the gain control circuit. The G signal at pin 12 of IC1 is fed to the High voltage board for controlling the optimum beam corresponding to the incoming scene.

4-2-2 Gain Control Circuit

Outline

This circuit sets the gain/amplitude of G signal to +0dB, +6dB or +12dB corresponding to the position of the High Gain Selection Switch on the side of camera.

Details

The G signal from the dark shading correction circuit is fed to the gain control circuit consisting of Q4 - Q6, Q37 and Q38. Q4 - Q6 control the gain and Q37 and Q38 reduce the noise when the gain is set to the +6dB and +12dB position. When the High Gain Selection Switch is selected to 0dB, +6dB or +12dB, the DC potential supplied through pin 17 of CN2 becomes +9V, 0V or -9V respectively and Q5, Q6, Q37 and Q38 work as shown in the Table next.

Position of High Gain Selection Switch	Gain Control Voltage	Q5	Q6	Q37	Q38
0dB	+9V	OFF	ON	OFF	OFF
+ 6dB	0V	ON	ON	ON	OFF
+12dB	-9V	ON	OFF	ON	ON

When the High Gain Selection Switch SW003 on the side of camera is set to the 0dB position, +9V is fed to the base of Q5 and Q6, and Q5 turns OFF and Q6 turns ON. As a result, the emitter resistor for amplifier Q4 becomes 560 ohms and the collector resistor becomes 0.75K ohms. When the switch SW003 is set to the +6dB position, 0V is supplied to the base of Q5 and Q6 turning them ON.

Therefore, the emitter resistor of Q4 becomes 280 ohms and the collector resistor becomes 0.75K ohms and the gain/amplitude of Q4 becomes double (+6dB) of that in the 0dB position of SW003. When the SW003 is set to the +12dB position, the gain control voltage becomes -9V turning Q5 ON and Q6 OFF. Therefore, the emitter resistor for Q4 is 280 ohms and the collector resistor is 1.5K ohms, and the gain/amplitude of Q4 becomes four times (+12dB) of that in 0dB position.

When the gain/amplitude increases +6dB and +12dB, the noise increases also +6dB and +12dB. Q37 and Q38 reduce the noise. When the High Gain Selection Switch SW003 is set to the 0dB position, the +9V is fed to the base of Q37 and Q38 turning them OFF. Therefore, Q37 and Q38 are not related to the circuit. When SW003 is set to the +6dB position, 0V is fed to Q37 and Q38 turning Q37 ON and turning Q38 OFF. As a result, C11 is connected to the output of amplifier Q4 reducing the frequency response of the G signal and reducing the noise. When the SW003 is set in the +12dB position, -9V is sent to Q37 and Q38 to turn them ON. Therefore, C11 and C10 are connected to the output of Q4 and noise is reduced more than that in the +6dB position with narrowing the frequency response.

The G signal thus controlled its gain is then fed to the pedestal setting circuit through buffer Q7, amplifier Q8 and buffer Q10 and Q11.

4-2-3 Pedestal Setting Circuit

Outline

This circuit sets the pedestal level of the green (G) signal by changing the clamp potential in the clamp circuit.

Details

The G signal Ⓓ from the gain control circuit is fed to the clamp circuit Q12 where the blanking level of the G signal is clamped by the clamp pulse (CP) Ⓔ fed to the base of Q12 and the blanking level is set to the DC voltage at the emitter of Q12. The G signal whose blanking potential is set is sent to the Process-2 board through pin 14 of CN2. In the Process-2 board, the G signal is mixed with the pre BL pulse Ⓕ and the mixed G signal Ⓖ is sent to the black level clip circuit where the low level (pre BL) portion of G signal Ⓖ is clipped. As a result the G signal Ⓗ is made. VR2 (G PEDESTAL PRESET) sets the pedestal level of the G signal by changing the clamp potential.

The Total Pedestal Control on the side of camera or on the remote control unit (RCU) is turned, the DC level supplied to the emitter of Q12 through pin 11 of CN2 is shifted changing the pedestal level of the G singal as well as those of the R and B singal.

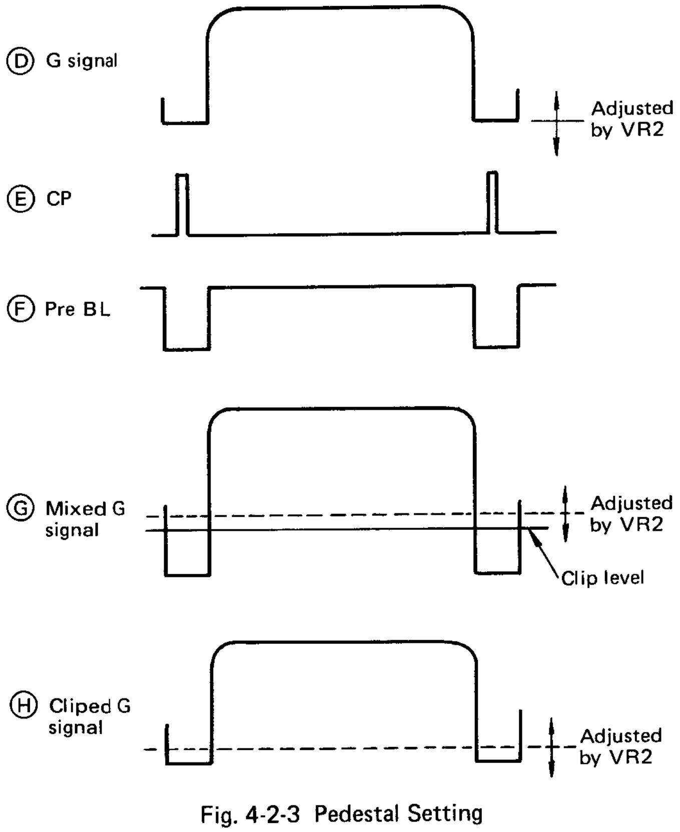

Fig. 4-2-3 Pedestal Setting

4-3 R Shading Correction/Gain Control Circuit

This circuit consists of the dark shading correction circuit, gain control circuit and pedestal setting circuit as in the case of the G shading correction/gain control circuit.

4-3-1 Dark Shading Correction Circuit

Outline

Refer to 4-2-1 Dark Shading Correction Circuit for the green (G) signal on page 7.

Details

The dark shading correction circuit for the red(R) signal is same as that for the G signal. Refer for the circuit description of G dark shading correction circuit to page 7.

The R signal is fed to the amp/shading correction circuit in IC3 through pin 3 of CN2 and VR3 (R INPUT GAIN). In the amp/shading correction circuit, the R signal undergoes the dark shading correction with the R dark shading correction signal supplied to pin 4 of IC3 where the R signal is clamped and the excessive high level of signal is clipped. The positive horizontal drive (HD) pulse is fed to blanking (BL) cleaner Q13 turning it ON during the BL period and removing the noise during the BL period. The corrected R signal at pin 6 of IC3 is fed to the gain control circuit through buffer Q14 and clamp/white clip circuit in IC3. The clamp pulse (CP) is fed to pin 7 of IC3.

The R signal at pin 12 of IC3 is fed to the High voltage board for setting the optimum beam corresponding to the scene.

4-3-2 Gain Control Circuit

Outline

This circuit sets the gain/amplitude of R signal to 0dB, +6dB or +12dB corresponding to the position of the High Gain Selection Switch on the side of camera as in the case of the gain control circuit for the G signal. This circuit also changes the level of the R signal by changing the R gain to coincide it with that of G signal for the automatic white balance setting.

Details

The R signal from the dark shading correction circuit is fed to the high gain control circuit consisting of Q15 - Q17, Q39 and Q40. This circuit operates same as the gain control circuit for the G signal.

Q15 - Q17 control the gain, and Q39 and Q40 reduce the noise when the gain is increased by setting the High Gain Selection Switch SW003. When SW003 is set to the 0dB, +6dB or +12dB position, the potential which is supplied to the bases of Q16, Q17, Q39 and Q40 becomes +9V, 0V or -9V respectively. Q16, Q17, Q39 and Q40 work as shown in the Table next.

Position of High Gain Selection Switch	Gain Control Voltage	Q16	Q17	Q39	Q40
0dB	+9V	OFF	ON	OFF	OFF
+ 6dB	0V	ON	ON	ON	OFF
+12dB	-9V	ON	OFF	ON	ON

As a result, the gain of Q15 becomes minimum in the 0dB position. In the +6dB position, the gain of Q15 becomes double of that in the 0dB position. In the +12dB position, the gain of Q15 becomes four times of that in the 0dB position.

Q39 and Q40 reduce the noise increased when SW003 is set to the +6dB or +12dB position. When SW003 is set to the +6dB position, Q39 is turned ON connecting C26 to the output of Q15. When SW003 is set to the +12dB position, Q39 and Q40 are turned ON connecting C26 and C25 to the output of Q15. In this way, the noise is reduced by limiting the frequency response of the amplifier.

The R signal whose gain is thus controlled is sent from the collector of Q15 through buffer Q18 to the amplifier IC4 which is a part of the automatic white balance setting loop to match the R signal to the G signal in level by changing the gain of IC4. The gain of IC4 is controlled by the DC voltage supplied to pin 6 of IC4 from the Auto board through pin 21 of CN2. The amplified R signal at pin 7 of IC4 is fed to the pedestal setting circuit through buffer Q19, amplifier Q20/Q21 and buffer Q22/Q23.

4-3-3 Pedestal Setting Circuit

Outline

This circuit sets the pedestal level of the red(R) signal by changing the clamp potential in the clamp circuit. The clamp potential which sets the pedestal level of R signal is automatically controlled in the automatic black balance setting and the pedestal level of R signal becomes same as G signal. This circuit is exactly same as that for the G signal. Refer to the pedestal setting circuit for the G signal on page 8.

Details

The R signal from the gain control circuit is fed to the clamp circuit Q24 where the blanking level of the R signal is clamped by the clamp pulse (CP) fed to the base of Q24 and the blanking level is set to the DC voltage at the emitter of Q24. The R signal whose blanking potential is set is sent to the Process-2 board through pin 15 of CN2. In the Process-2 board, the R signal is mixed with the negative preblanking (pre BL) pulse and the mixed R signal is sent to the black level clip circuit where the low level (pre BL) portion of R signal is clipped. As a result, the R signal whose pedestal is set is made.

VR4 (R PEDESTAL PRESET) sets the pedestal level of the R signal by changing the clamped potential. The pedestal level of the R signal is also controlled by the DC voltage from the automatic black control circuit in the Auto board, and by the DC voltage set with the R and total pedestal control on the side of camera or on the remote control unit (RCU). The DC voltage is sent to the emitter of Q24 through pin 12 of CN2.

4-4 B Shading Correction/Gain Control Circuit

This circuit is exactly same as R shading correction/gain control circuit and similar to that for the G signal. This circuit consists of the dark shading correction circuit, gain control circuit and pedestal setting circuit.

4-4-1 Dark Shading Correction Circuit

Outline

Refer to 4-2-1 Dark Shading Correction Circuit for the green(G) signal on page 7.

Details

The dark shading correction circuit for the blue(B) signal is same as that for the G signal. Refer for the circuit description of G dark shading correction circuit to page 7.

The B signal is fed to the amp/shading correction circuit in IC5 through pin 2 of CN2 and VR5 (B INPUT GAIN). In the amp/shading correction circuit, the B signal undergoes the dark shading correction with the B dark shading correction signal supplied to pin 4 of IC5. The positive horizontal drive (HD) pulse is fed to blanking (BL) cleaner Q25 turning it ON during the BL period and removing the noise during the BL period. The corrected B signal at pin 6 of IC5 is fed to the gain control circuit through buffer Q26 and clamp/white clip circuit in IC5 where the B signal is clamped and the excessive high level of B signal is clipped. The clamp pulse (CP) is fed to pin 7 of IC5. The B signal at pin 12 of IC5 is fed to the High voltage board for setting the optimum beam corresponding to the scene.

4-4-2 Gain Control Circuit

Outline

This circuit sets the gain/amplifier of B signal to 0dB, +6dB or +12dB corresponding to the position of the High Gain Selection Switch on the side of camera as in the case of the gain control circuit for the G signal. This circuit also changes the level of the B signal by changing the B gain to coincide it with that of G signal for the automatic white balance setting.

Details

The B signal from the dark shading correction circuit is fed to the high gain control circuit consisting of Q27 -Q29, Q41 and Q42. This circuit operates same as the gain control circuit for the G signal.

Q27 - Q29 control the gain, and Q41 and Q42 reduce the noise when the gain is increased by setting the High Gain Selection Switch SW003. When SW003 is set to the 0dB, +6dB or +12dB position, the potential which is supplied to the bases of Q28, Q29, Q41 and Q42 becomes +9V, 0V or -9V respectively. Q28, Q29, Q41 and Q42 work as show in the Table below.

Position of High Gain Selection Switch	Gain Control Voltage	Q28	Q29	Q41	Q42
0dB	+9V	OFF	ON	OFF	OFF
+ 6dB	0V	ON	ON	ON	OFF
+12dB	-9V	ON	OFF	ON	ON

As a result, the gain of Q27 becomes minimum in the 0dB position. In the +6dB position, the gain of Q27 becomes double of that in the 0dB position. In the +12dB position, the gain of Q27 becomes four times of that in the 0dB position.

Q41 and Q42 reduce the noise increased when SW003 is set to the +6dB or +12dB position. When SW003 is set to the +6dB position, Q41 is turned ON connecting C44 to the output of Q27. When SW003 is set to the +12dB position, Q41 and Q42 are turned ON connecting C44 and C43 to the output of Q27. In this way, the noise is reduced by limiting the frequency response of the amplifier.

The B signal whose gain is thus controlled is sent from the collector of Q27 through buffer Q30 to the amplifier IC6 which is a part of the automatic white balance setting loop to match the B signal to the G signal in level by changing the gain of IC6. The gain of IC6 is controlled by the DC voltage supplied to pin 6 of IC6 from the Auto board through pin 18 of CN2. The amplified B signal at pin 7 of IC6 is fed to the pedestal setting circuit through buffer Q31, amplifier Q32/Q33 and buffer Q34/Q35.

4-4-3 Pedestal Setting Circuit

Outline

This circuit sets the pedestal level of the blue(B) signal by changing the clamp potential in the clamp circuit. The clamp potential which sets the pedestal level of B signal is automatically controlled in the automatic black balance setting and the pedestal level of B signal becomes same as G signal. This circuit is exactly same as that for the G signal. Refer to the pedestal setting circuit for the G signal on page 8.

Details

The B signal from the gain control circuit is fed to the clamp circuit Q36 where the blanking level of the B signal is clamped by the clamp pulse (CP) fed to the base of Q36 and the blanking level is set to the DC voltage at the emitter of Q36. The B signal whose blanking potential is set is sent to the Process-2 board through pin 16 of CN2. In the Process-2 board, the B signal is mixed with the negative preblanking (pre BL) pulse and the mixed B signal is sent to the black level clip circuit where the low level (pre BL) portion of B signal is clipped. As a result, the B signal whose pedestal is set is made.

VR6 (B PEDESTAL PRESET) sets the pedestal level of the B signal by changing the clamped potential. The pedestal level of the B signal is also controlled by the DC voltage from the automatic black control circuit in the Auto board, and by the DC voltage set with the B and total pedestal control on the side of camera or on the remote control unit (RCU). The DC voltage is sent to the emitter of Q36 through pin 13 of CN2.

5. Process-2 Board

The Process-2 board contains following circuits.

Page
5-1 G Signal Processing Circuit 12
5-2 R Signal Processing Circuit 13
5-3 B Signal Processing Circuit 14
5-4 V Detail Signal Generator Circuit 14
5-5 H Detail Signal Generator Circuit 15
5-6 Detail Control Circuit 15

5-1 G Signal Processing Circuit

Outline

In this circuit, the green(G) signal supplied from the Process-1 board undergoes gamma(γ) correction, white clip and black clip. The corrected signal is then fed to the Encoder board which makes PAL signal.

Details

The G signal Ⓐ is supplied from the Process-1 board through pin 14 of CN3 to the preblanking mix circuit in IC1 where the preblanking (pre BL) pulse Ⓑ is mixed with the G signal Ⓐ. The mixed G signal Ⓒ is then sent to the black clip circuit in IC1 and the low level is clipped to set the pedestal level of the G signal (Ⓓ). The clip level is set by the DC voltage at pin 17 of IC1.

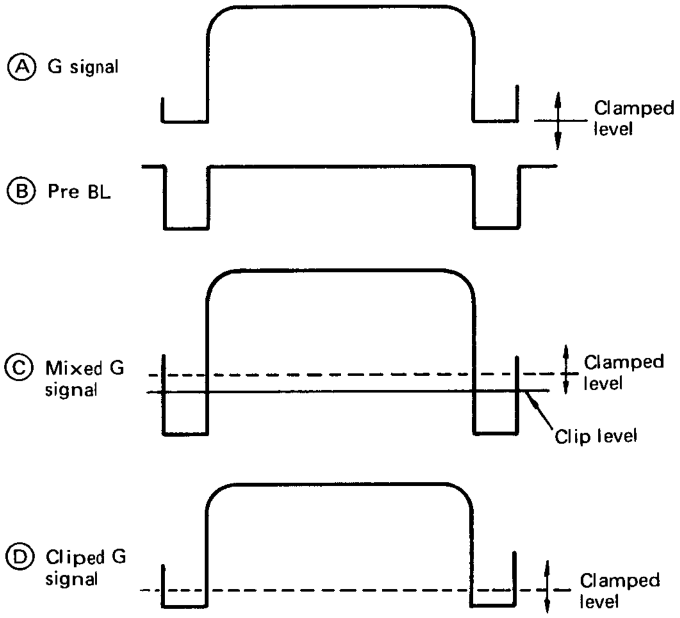

Fig. 5-1-1 Pedestal Setting

The G signal whose pedestal level is thus set is applied to the gamma (γ) correction circuit. The G signal obtained at pin 14 of IC1 is fed through pin 10 of CN3 to the Auto board to detect the G signal level and pedestal level for the automatic white balance and black balance setting. The G signal Ⓔ at pin 15 of IC1 is non-additively mixed with the red(R) and blue(B) signal (Ⓕ and Ⓖ) obtained at pin 15 of IC4 and IC7 and the highest signal H is detected. The signal Ⓗ is fed to the AIC board through pin 6 of CN3 to set the lens iris automatically corresponding to the incoming light intensity.

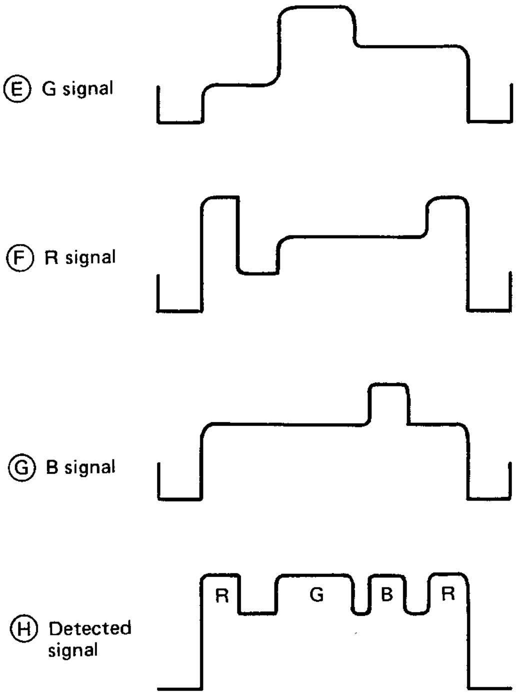

Fig. 5-1-2 NAM Mix

- Gamma Correction Circuit

Outline

This circuit corrects the non-linear photoelectric conversion characteristic of cathode ray tube (CRT) and reproduces a linear picture of high fidelity on the color monitor.

In order for a televised picture to have the same contrast gradation as the original scene, the system (including the pick-up tube, signal processing inside camera and monitor, and CRT) gamma must be equal to 1.

The gamma characteristic of pick-up tube (SATICON^{TM}) is approx. 1.0 and the gamma characteristic of the monitor CRT is approx. 2.2, so that the gamma characteristic of the gamma correction circuit should be approx. 0.45, which makes the total gamma to be approx. 1.0 as shown in Fig. 5-1-3.

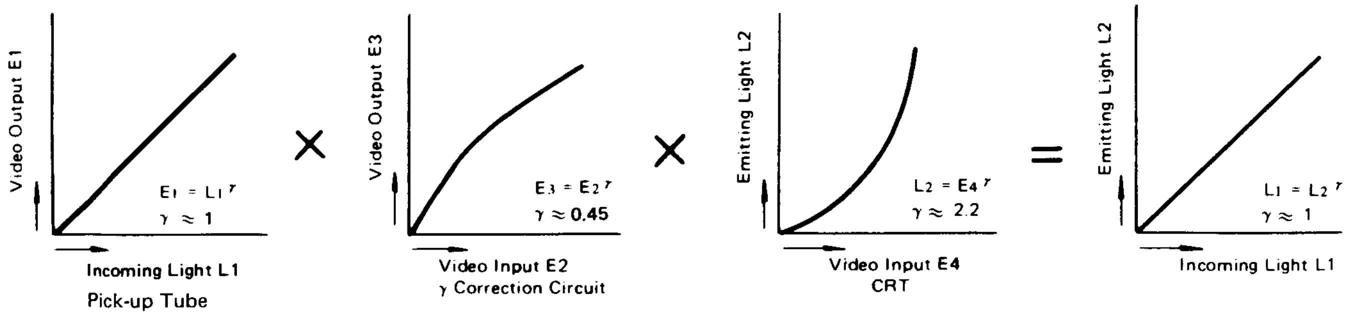

Fig. 5-1-3 Gamma Correction

Details

The G signal is fed from the black clip circuit to the gamma correction circuit in IC1 and undergoes the gamma correction. The characteristic of gamma correction is determined by the DC voltages supplied to pins 10, 11 and 12 of IC1 from gamma bias Q11. VR1 (G GAMMA) adjusts the gamma correction of the G signal.

The G signal undergoes the gamma correction and obtained at the emitter of buffer Q1 is sent through the H detail signal generator circuit (L5, buffer in IC6, L6) and pin 17 of IC2 to the amplifier where it is amplified. At the amplifier, the H and V detail (aperture) signal supplied through pin 15 of IC2 is mixed with the G signal to enhance the resolution. The V detail signal is delayed approximately 0.56μs and the H detail signal is delayed 90ns from the G signal. Therefore, the G signal is delayed by passing through L5 and L6 in the H detail signal generator circuit to match it to the H and V detail signal in phase. The G signal at pin 13 of IC2 is supplied to clamp circuit Q2 where the blanking (BL) period of the G signal is clamped by the clamp pulse (CP) fed to the base of Q2 and the BL level is set to the DC voltage which is controlled by VR3 (G PEDESTAL). The clamped G signal at pin 12 of IC2 is then fed to the white clip and black clip circuit where its low level is clipped to setting the pedestal level and the excessively high level is also clipped. The white clip level is set by VR4 (G WHITE CLIP). After setting its level with VR2 (G GAIN), the G signal is fed through the output circuit in IC2 and pin 3 of CN3 to the Encoder board.

5-2 R Signal Processing Circuit

Outline

In this circuit, the red(R) signal supplied from the Process-1 board undergoes gamma (γ) correction, white clip and black clip as in the case of the G signal processing circuit. The corrected signal is then fed to the Encoder board.

Details

This circuit is similar to the G signal processing circuit. The R signal is supplied from the Process-1 board through pin 15 of CN3 to the preblanking mix circuit in IC4 where the preblanking (pre BL) pulse is mixed with the R signal. The mixed R signal is then sent to the black clip circuit in IC4 and the low level is clipped to set the pedestal level of the R signal. The clip level is set by the DC potential at pin 17 of IC4. The R signal whose pedestal is set is supplied to the gamma correction circuit. The R signal obtained at pin 14 of IC4 is fed through pin 8 of CN3 to the Auto board to detect the R signal level and pedestal level for the automatic white balance and black balance setting. The R signal at pin 15 of IC4 is non-additively mixed with the green(G) and blue(B) signal obtained at pin 15 of IC1 and IC7 and the highest signal is detected. (Refer to the G signal processing circuit on page 12.) The detected signal is fed to the lens to set the lens iris automatically corresponding to the incoming light intensity.

- **Gamma Correction Circuit**

Outline

Refer to the outline of gamma correction circuit for the G signal on page 12.

Details

The R signal is fed from the black clip circuit to the gamma correction circuit in IC4 and undergoes the gamma correction. The characteristic of gamma correction is determined by the DC voltage supplied to pins 10, 11 and 12 of IC4 from gamma bias Q11. VR6 (R GAMMA) adjusts the gamma correction of the R signal.

The R signal undergoes the gamma correction and obtained at the emitter of buffer Q8 is sent through pin 17 of IC5 to the amplifier. In the amplifier, the H and V detail signal supplied through pin 15 of IC5 is mixed with the R signal for enchancing the resolution. The amplified R signal at pin 13 of IC5 is fed to clamp circuit Q9 where the blanking (BL) period of the R signal is clamped by the clamp pulse (CP) fed to the base of Q9 and the BL level is set to the DC voltage which is controlled by VR8 (R PEDESTAL). The clamped R signal at pin 12 of IC5 is then fed to the white clip and black clip circuit where its low level is clipped to set the pedestal level and the excessively high level is also clipped. The white clip level is set by VR9 (R WHITE CLIP). After setting its level with VR7 (R GAIN) the R signal is fed through the output circuit in IC5 and pin 2 of CN3 to the Encoder board.

5-3 B Signal Processing Circuit

Outline

In this circuit, the blue(B) signal supplied from the Process-1 board undergoes gamma (γ) correction, white clip and black clip as in the case of the G and R signal processing circuit. The corrected signal is then fed to the Encoder board.

Details

This circuit is exactly same as the R signal processing circuit.

The B signal is supplied from the Process-1 board through pin 16 of CN3 to the preblanking mix circuit in IC7 where the preblanking (pre BL) pulse is mixed with the B signal. The mixed B signal is then sent to the black clip circuit in IC7 and the low level is clipped to set the pedestal level of the B signal. The clip level is set by the DC potential at pin 17 of IC7. The B signal whose pedestal is set is supplied to the gamma correction circuit. The B signal obtained at pin 14 of IC7 is fed through pin 7 of CN3 to the Auto board to detect the B signal level and pedestal level for the automatic white balance and black balance setting. The B signal at pin 15 of IC7 is non-additively mixed with the green (G) and red (R) signal obtained at pin 15 of IC1 and IC4 and the highest signal is detected. (Refer to the G signal processing circuit on page 12.) The detected signal is fed to the lens to set the lens iris automatically corresponding to the incoming light intensity.

- **Gamma Correction Circuit**

Outline

Refer to the outline of gamma correction circuit for the G signal on page 12.

Details

The B signal is fed from the black clip circuit to the gamma correction circuit in IC7 and undergoes the gamma correction. The characteristic of gamma correction is determined by the DC voltage supplied to pins 10, 11 and 12 of IC7 from gamma bias Q11. VR12 (B GAMMA) adjusts the gamma correction of the B signal.

The B singal undergoes the gamma correction and obtained at the emitter of buffer Q12 is sent through pin 17 of IC8 to the amplifier. In the amplifier, the H and V detail signal supplied through pin 15 of IC8 is mixed with the B signal to enhance the resolution. The amplified B signal at pin 13 of IC8 is fed to clamp circuit Q13 where the blanking (BL) period of the B signal is clamped by the clamp pulse (CP) fed to the base of Q13 and the BL level is set to the DC voltage which is controlled by VR14 (B PEDESTAL). The clamped B signal at pin 12 of IC8 is then fed to the white clip and black clip circuit where its low level is clipped to set the pedestal level and the excessively high level is also clipped. The white clip level is set by VR15 (B WHITE CLIP). After setting its level with VR13 (B GAIN) the B signal is fed through the output circuit in IC8 and pin 4 of CN3 to the Encoder board.

5-4 V Detail Signal Generator Circuit

Outline

This circuit generates a vertical detail (edge) signal for increasing the vertical resolution by enhancing vertical edge contrast.

Details

The green (G) signal obtained at the emitter of buffer Q1 in the G signal processing circuit is fed to pin 1 of modulator IC3 through the low pass filter (LPF) consisting of L1, L2, C7 and C8, buffer Q4 and VR5 (V DETAIL BALANCE). In IC3, the G signal modulates the 4.43MHz subcarrier (SC) signal supplied to pin 3 of IC3. The modulated G signal at pin 7 of IC3 is supplied to 1H glass delay line L4 where the modulated G signal is delayed 1 line (1H : 64 μsec). The 1H delayed modulated G signal is then fed to transformer T1 where the positive and negative modulated signal (Ⓐ and Ⓑ) are generated at pins 3 and 5 of T1. The modulated G signal Ⓐ and Ⓑ are sent to the detector circuit consisting of Q5 and Q6 where only the positive portion of signal Ⓐ and Ⓑ are detected and the signal Ⓒ is made. The 8.86MHz ripple on the signal Ⓒ is removed by the LPF L7 later (Ⓓ).

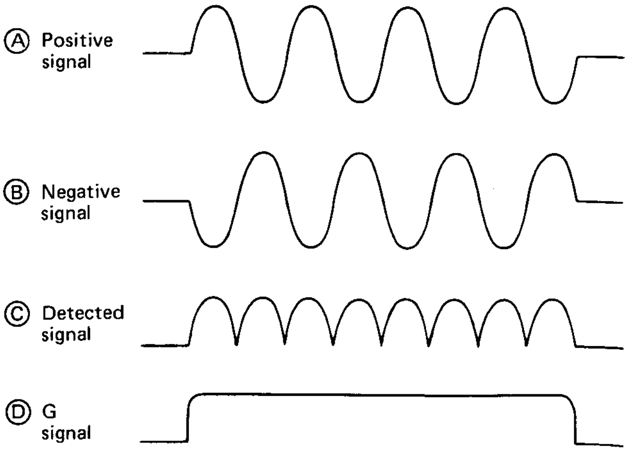

Fig. 5-4-1 Detection

The 1H delayed G signal Ⓔ is then fed to the emitter of mixer Q7 where it is mixed with the non-delayed G signal Ⓕ supplied to the base of Q7 and the vertical detail (edge) signal Ⓖ is generated. The V detail (edge) signal is then applied to the LPF which removes the 8.86MHz ripple produced in the detection. The V detail (edge) signal passes through buffer Q10 and VR11 (H/V MIX BALANCE) and mixed with the horizontal detail (aperture) signal from the H detail signal generator circuit. VR5 adjusts level of the delayed G signal to cancel the non-delayed G signal.

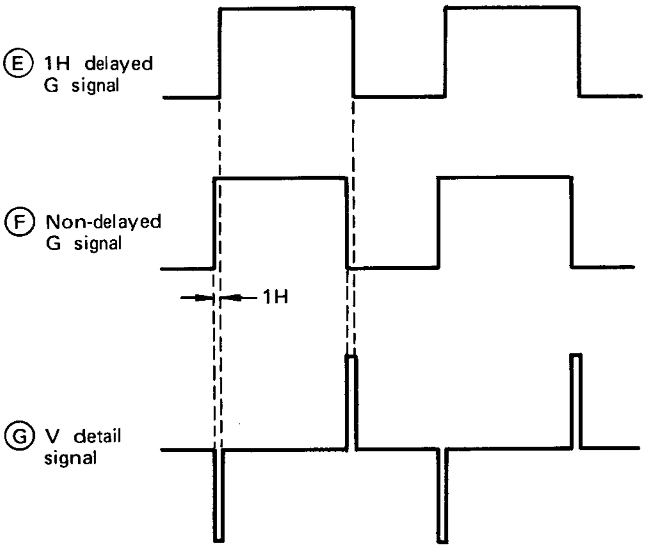

Fig. 5-4-2 V Detail Signal

5-5 H Detail Signal Generator Circuit

Outline

This circuit generates the horizontal (H) detail (aperture) signal to enhance the H resolution.

Details

The green (G) signal obtained at the emitter of buffer Q1 in the G signal processing circuit is fed to buffer in IC6 through delay line L5. Since the vertical (V) detail (edge) signal delays 0.56 μs from the G signal with the low pass filter consisting of L1 and L2, and L7 in the V detail signal generator circuit, the G signal is delayed 0.56 μs by L5 to match with the V detail (edge) signal in phase. When the camera is aimed at an object Ⓐ for example, the G signal Ⓑ at pin 3 of IC6 is fed to the H aperture generator circuit in IC6 through pin 4. The G signal Ⓒ which is delayed 150μs by delay line L6 is applied to the H aperture generator circuit. The G signal Ⓒ is amplified in the H aperture generator circuit and the G signal Ⓓ is made. The G signal Ⓔ which results from the delayed G signal Ⓒ being reflected back through delay line L6 and delayed again (300 ns) is fed to the H aperture generator circuit through pin 4 of IC6. In the H aperture generator circuit, the signal Ⓑ, Ⓓ and Ⓔ are mixed together in fixed proportion to make up the H detail (aperture) signal Ⓕ.

The H detail (aperture) signal is mixed with the vertical detail (edge) signal through buffer in IC6, VR10 (H DETAIL LEVEL) and amplifier in IC6. The H and V detail signal mixed is fed to the detail control circuit.

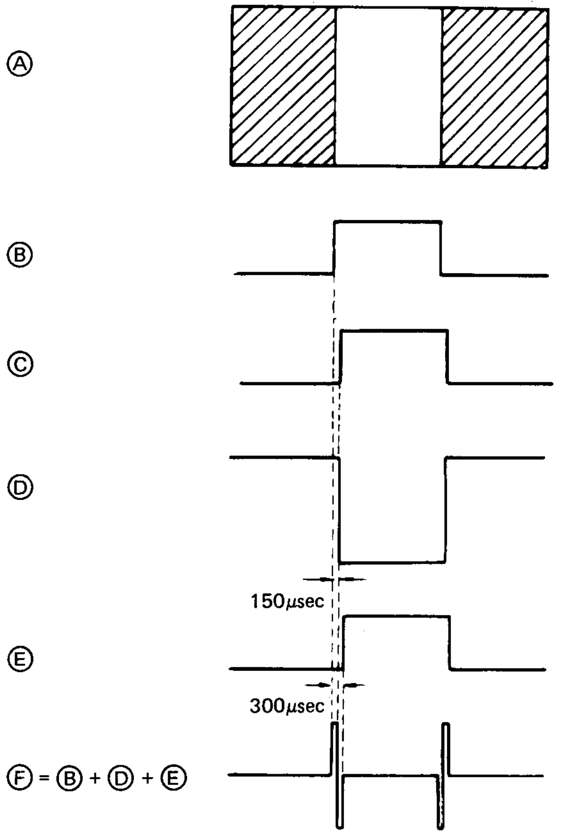

Fig. 5-5-1 H Detail Signal

5-6 Detail Control Circuit

Outline

This circuit receives the mixed signal of the horizontal (H) and vertical (V) detail signal and sends to the R, G and B signal processing circuit after removing the noise. This circuit also controls adding the detail signal to the R, G and B signal or not.

Details

The mixed signal of H and V detail signal is fed from the H and V detail signal generator circuit through C26 and amplifier IC9 to the noise coring circuit which consists of D2 and D3. The detail signal Ⓐ with noise is fed to the D2 and D3. The center (noise) portion of the detail signal is suppressed by threshold level of D2 and

D3 (Ⓑ). VR16 (DETAIL NOISE SUPPRESS) adjusts the noise suppress level. The detail signal whose level is set by VR17 (DETAIL GAIN) is sent to pin 15 of IC2, IC5 and IC8 in the G, R and B processing circuit through buffer Q15. When the Detail ON/OFF Switch on the side of camera is set to the ON position, the low level is fed to the base of Q14 turning it OFF. Therefore, the detail signal is fed and mixed with the R, G and B signal. However, the ON/OFF Switch is set to the OFF position, the high level is sent to the base of Q14 turning it ON. As a result, the detail signal is grounded and it is not mixed with the R, G and B signal.

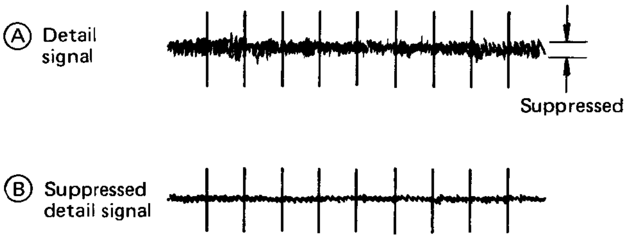

Fig. 5-6-1 Noise Suppresion

6 Encoder Board

The Encoder board contains following circuits.

Page
6-1 +4.5V/+3.2V DC Regulator Circuit 16
6-2 Color Bar Circuit 16
6-3 B-Y(U) Subcarrier Signal Circuit 17
6-4 Chroma Encoding Circuit 17
6-5 Chroma Amplifier Circuit 18
6-6 PAL Output Circuit 18
6-7 Pix Output Circuit 19

6-1 +4.5V/+3.2V DC Regulator Circuit

Outline

+4.5V and +3.2V DC are produced by regulating +9V DC. The +4.5V and +3.2V are used for other circuits as sub-power source.

Details

+4.5V and +3.2V are generated by regulating +9V DC with IC10. The reference voltage for +4.5V is obtained by dividing +9V with R74 and R75. The output voltage at pin 1 is fed back to pin 2 for stabilizing the +4.5V DC.
The reference voltage for +3.2V is obtained by dividing +9V with R76 and R77. The output voltage at pin 7 is fed back to pin 6 for stabilizing the +3.2V. These voltages are fed to other circuit for the sub-power source.

6-2 Color Bar Circuit

Outline

This circuit generates the red(R), green(G) and blue(B) bar signal for making a color bar signal. The R, G and B bar signals are then fed to the chroma encoding circuit.

Details

The NAND gate connected between pins 13 and 14 and inverter connected between pins 11 and 12 make up the oscillator whose oscillating frequency is set to approximately 134kHz by VR1 (BAR WIDTH). When the Color Bar/Camera Selection Switch on the side of camera is set to the BAR position, the low potential is sent to the NOR gate through pin 6 of IC1 and the encoder blanking (BL) pulse Ⓐ is fed to the oscillator through pin 7, the NOR gate and pins 5 and 15 to reset the oscillator. As a result, the signal Ⓑ is obtained at pin 11 of IC1. The signal Ⓑ is fed to the clock input (pin 15) of counter IC2 and is counted down. The B bar signal Ⓒ obtained at pin 6 of IC2, the R bar signal Ⓓ at pin 11 and the G bar signal Ⓔ are fed to the resistance-matrix circuit through buffers in IC8. The B bar signal Ⓒ, the R bar signal Ⓓ and the G bar signal Ⓔ are also sent to the AND gate circuit consisting of D3 - D5 and the gated signal Ⓕ is obtained at pin 5 of IC8. The gated signal Ⓕ is then resistance-mixed with the B bar signal Ⓒ, the R bar signal Ⓓ and the G bar signal Ⓔ through buffers in IC8 and the EBU B bar signal Ⓖ, the EBU R bar signal Ⓗ and the EBU G bar signal Ⓘ is made. These EBU bar signals are fed to chroma encoding circuit. The encoder BL pulse Ⓐ is differentiated by R90 and C43. The negative portion of differentiated signal Ⓙ is removed by D2. The resultant signal Ⓚ is supplied to pin 1 of IC2 so that the encoder BL period of the R, G and B bar signal becomes the low level. When the Color Bar/Camera Selection Switch is set to the CAMERA position, the pin 6 of IC1 becomes high level and pin 5 of IC1 is set to high level regardless of the encoder BL pulse. At the same time, the high level is sent to the reset input (pin 9) of IC2 and IC2 stops counting.

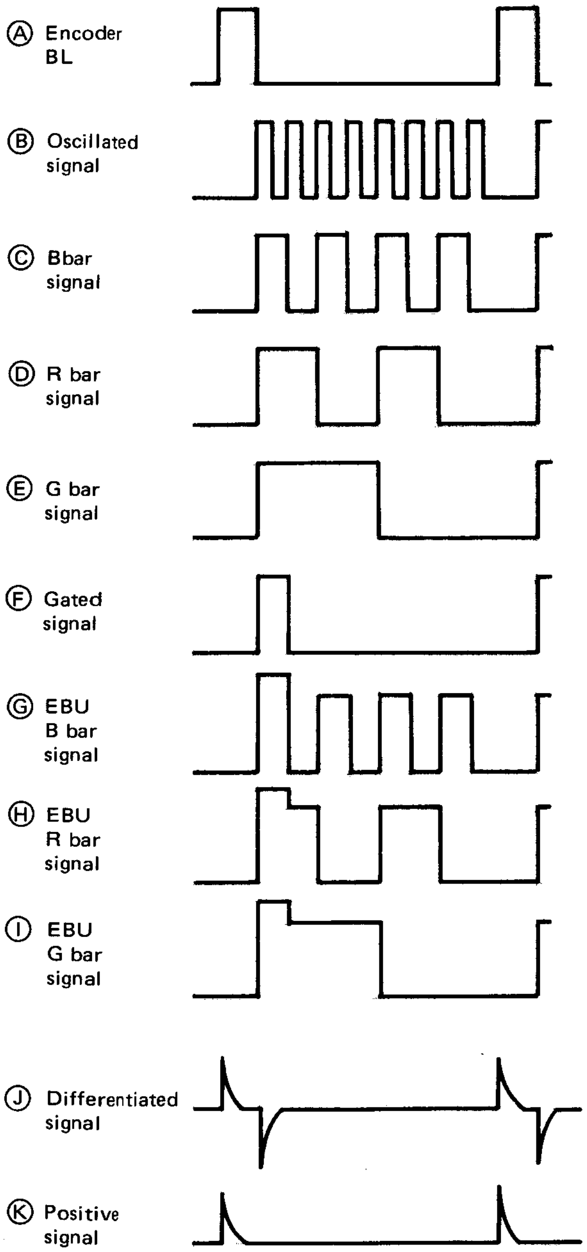

Fig. 6-2-1 Color Bar

6-3 B-Y(U) Subcarrier Signal Circuit

Outline

This circuit receives the subcarrier (SC) signal from the Sync-1 board and sends the SC signal to the B-Y(U) modulator in the chroma encoding circuit.

Details

The SC signal from the Sync-1 board is supplied to buffer Q8 through pin 21 of CN5. The SC signal at the emitter of Q8 is fed to the 90° delay circuit consisting of L5, C24 and VR9 (SC QUAD) where SC signal is delayed 90°. The delayed SC signal is then sent through buffer Q7 to pin 3 of modulator IC7 for modulation of B-Y(U) signal. The SC signal for modulation of R-Y(V) signal is sent through pin 15 of CN5 to pin 3 of modulator IC6.

6-4 Chroma Encoding Circuit

Outline

This circuit receives the red (R), green (G) and blue (B) signal from the Process-2 board or the color bar circuit and makes the R-Y(V) and B-Y(U) signals.

These signals modulates the SC signal to make the chrominance signal. The burst signal is also made in this circuit. The chrominance signal is then sent to the chroma amplifier circuit. In this circuit, the luminance signal is also made from the R, G and B signal and it is fed to the PAL output circuit.

Details

The R, G and B signal are supplied from the Process-2 board to pins 13, 1 and 3 of analog switch IC3 through pins 2, 3 and 4 of CN5 respectively. The R, G and B bar signal are fed from the color bar circuit to pins 12, 2 and 5 of IC3. When the Color Bar/Camera Selection Switch on the side of camera is set to the CAMERA position, the control terminal of analog switch IC3 at pins 9, 10 and 11 becomes high level and the R, G and B signal from the Process-2 board are sent to buffers Q1, Q2 and Q3 respectively. However, the Selection Switch is in BAR position, pins 9, 10 and 11 of IC3 become low level, the switches are set to the upper side and the R, G and B color bar signal are sent to Q1, Q2 and Q3 respectively.

The R signal at the emitter of Q1 is supplied through R22 to the emitter of mixer Q5 and the G and B signal at the emitter of Q2 and Q3 are sent through R23/R24, R25/R26 and VR2 (V WHITE BALANCE) to the base of Q5 respectively. The R, G and B signal are resistance-matrixed in the fixed proportion as shown below and the R-Y(V) signal is obtained at the collector of Q5.

$$R\text{-}Y(V) = 0.70R - 0.59G - 0.11B$$

The R-Y(V) signal thus made is sent through the low pass filter (LPF) consisting of C46, C47, R72 and R73 to the buffer in IC4. The LPF limits the frequency response to 1.5 MHz. The R-Y(V) signal is then mixed with the burst flag pulse (BFP) supplied through VR3

(BURST LEVEL) and VR12 (BURST PHASE) for making the burst signal. The mixed signal is applied through amplifier and the clamp circuit in IC4 to pin 1 of balance modulator IC6. The clamp pulse (CP) and the clamped DC voltage go to pins 6 and 5 of IC4. In IC6, the R-Y(V) signal modulates the subcarrier (SC) signal supplied through pin 3 of IC6. The modulated R-Y(V) signal at pin 7 of IC6 is mixed with the modulated B-Y(U) signal. VR6 (V CARRIER BALANCE) adjusts the DC level at pin 5 of IC6 to minimize the carrier leak from the modulator.

The B signal at the emitter of Q3 is fed through R36 and VR4 (U WHITE BALANCE) to mixer Q6 and the R and G signal at the emitter of Q1 and Q2 are sent via R37/R38 and R34/R35 to the emitter of Q6 respectively. The R, G and B signal are resistance-matrixed in the fixed proportion as shown below and the B-Y(U) signal is obtained at the collector of Q6.

B-Y(U) = 0.89B - 0.59G - 0.3R

The B-Y(U) signal which is made in this way is sent through the low pass filter (LPF) consisting of C49, C50, R88 and R89 to the buffer in IC5. The LPF limits the frequency response to 1.5 MHz. The B-Y(U) signal at pin 3 of IC5 is supplied through VR5 (U GAIN) and the amplifier in IC5 to the clamp circuit where it is clamped by the CP supplied to pin 6 of IC5.

The BFP is mixed with the B-Y(U) signal through VR3 (BURST LEVEL) and VR12 (BURST PHASE) for making the burst signal. The clamped B-Y(U) signal at pin 8 of IC5 is sent to pin 1 of balance modulator IC7 where it modulates the SC signal fed through pin 3 of IC7. The modulated B-Y(U) signal at pin 7 of IC7 is mixed with the modulated R-Y(V) signal and the chrominance signal which is supplied to the chroma amplifier circuit is made. VR7 (U CARRIER BALANCE) adjusts the DC level at pin 5 of IC7 to minimize the carrier leak from the modulator, SW1 (U/V ON/OFF SWITCH) is used for confirming the R-Y(V) or B-Y(U) signal by switching OFF the B-Y(U) or R-Y(V) signal. The R, G and B signal obtained at the emitters of Q1, Q2 and Q3 are fed to the resistance matrix circuit which is connected to the base of buffer Q4. These signals are mixed in the fixed proportion as shown below and the luminance (Y) signal is made.

Y = 0.59G + 0.3R + 0.11B

The Y signal thus made is sent from the emitter ofQ4 to the PAL output circuit.

6-5 Chroma Amplifier Circuit

Outline

This circuit receives the chrominance signal from the chroma encoding circuit and sends it to the PAL output circuit after the amplification.

Details

The chrominance signal Ⓐ is fed from the chroma encoding circuit to the amplifier Q16 through the 4.43 MHz band pass filter (BPF) consisting of C20 - C23 and L2 - L4, where the harmonics of 4.43 MHz is removed and only the original frequency is detected.

The blanking (BL) pulse Ⓑ is fed to pin 5 of analog switch IC11 and the burst flag pulse (BFP) Ⓒ is fed to the control terminal (pin 9) of IC11 through inverter in IC1. Therefore, the pulse Ⓓ is obtained at pin 4 of IC11 and it is sent to BL noise suppressor Q17 to remove the noise during the BL period. The chrominance signal Ⓔ at the collector of Q16 is then fed to the PAL output circuit through buffer Q18.

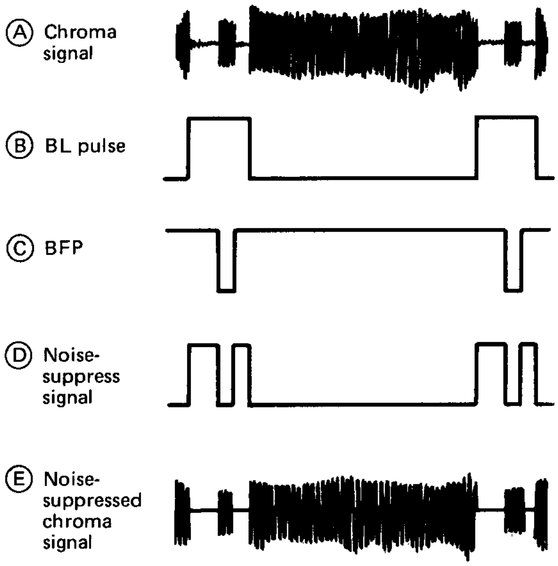

Fig. 6-5-1 Noise Suppression

6-6 PAL Output Circuit

Outline

This circuit receives the luminance (Y) signal, the chrominance signal with the burst, and the sync signal to make a PAL signal. The PAL signal is fed to the video output connector.

Details

The luminance (Y) signal is supplied to buffer in IC9 through amplifier Q9 and delay line L7 which delays the Y signal to match with the chrominance signal in phase. VR10 (Y GAIN) adjusts the Y signal level. The Y signal obtained at pin 5 of IC9 is sent through amplifier in IC9 to the clamp circuit Q10 where it is clamped by the clamp pulse (CP) supplied to the base of Q10. The clamped Y signal Ⓐ is then sent through the analog switch IC11 to the Y/chroma mix circuit in IC9. The blanking (BL) pulse B is fed to control terminals (pins 10 and 11) of IC11 and the DC potential during the BL

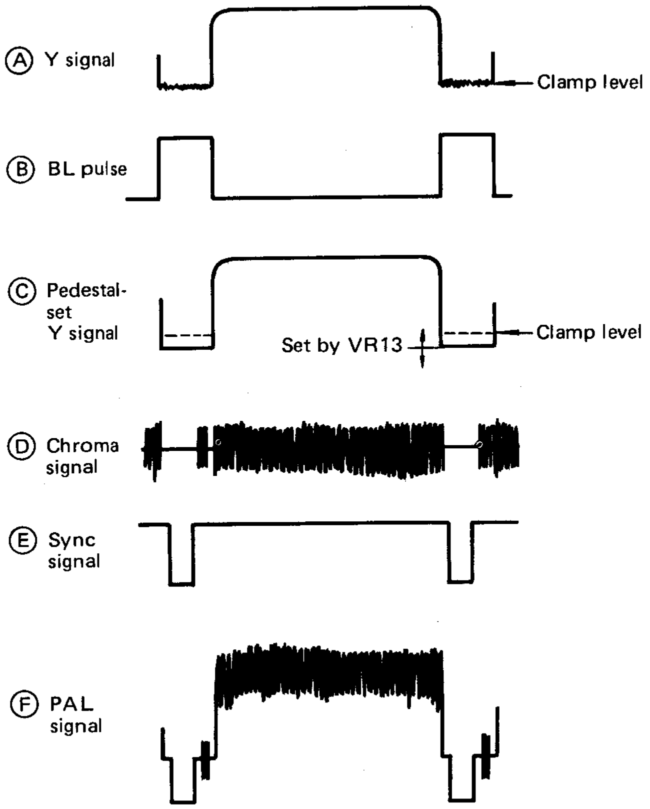

Fig. 6-6-1 NTSC Signal

period of Y signal becomes the DC voltage set by VR13 (BAR PEDESTAL) and the pedestal level of Y signal is set (C).

In the Y/chroma mix circuit, the Y signal is mixed with the chrominance signal D supplied through R68 and pin 19 of IC9 and the sync signal E supplied through VR11 (SYNC LEVEL) and pin 19 of IC9, and the PAL signal F is made. The PAL signal is then fed to the video output connector through the video output circuit consisting of Q11 - Q13 and pin 10 of CN5. The PAL signal is also fed to the pix output circuit from pin 22 of IC9. The Y signal and the chrominance signal are also fed to the Mother board through pins 16 and 14 of CN5 respectively.

6-7 Pix Output Circuit

Outline

This circuit sends the PAL, red (R), green (G), blue (B), R-G or B-G signal according to the position of the Monitoring Signal Selection Switch, Registration Switch and -G ON/OFF Switch on the side of camera.

Details

The R and B signal are fed to pins 12 and 13 of analog switch IC12 and selected by the level of pix control (A) signal supplied through pin 17 of CN5 to pin 11 of IC12. When the pix control (A) signal is low (L) potential by setting the Registration Switch to the R position, the R signal is selected. When it is high (H) potential with setting the switch to the B position, the B signal is selected. The selected signal is routed to pin 2 of IC12 and the G signal is sent to pin 1 of IC12. They are selected by the level of pix control (B) signal supplied through pin 18 of CN5 to pin 10 of IC12. When the Registration Switch is set to the R or B position, the pix control (B) signal is L level and the R or B signal is selected. When it is H level in the G position, the G signal is selected. The selected R, B or G signal obtained at pin 15 of IC15 is then applied to the mix circuit in IC13 thorough pin 10. The G signal is fed to buffer in IC13. When the -G ON/OFF Switch is set to the ON position, the pix control (C) signal which is fed through pin 19 of CN5 and inverter in IC1 to pin 7 of IC13 becomes L level and the G signal is negatively mixed with the R, G or B signal through the select circuit. When the -G ON/OFF Switch is set to the OFF position, pin 7 of IC13 becomes H level and -G signal is not mixed.

Pix Control Potential

Switch	Position	Pix Control				
		A	B	C	D	E
Monitoring Signal Select Switch	ENG				L	
	REG				H	
	AUX					H
Registration Switch	R	L	L			
	G	H	H			
	B	H	L			
–G ON/OFF Switch	OFF			L		
	ON			H		

The signal obtained at pin 14 of IC13 is then fed to buffer Q16. At the base of Q16, the sync signal which is fed through pin 7 of CN5 and R95 is mixed with the selected signal to make the composite signal. The composite selected signal at the emitter of Q16 is fed to pin 3 of IC12 and the composite PAL signal from the PAL output circuit to pin 5 of IC12. They are selected by the level of pix control (D) signal at pin 9 of IC12. When the Monitoring Signal Selection Switch is set to the ENC (encoded) position, the pix control (D) signal becomes L level and the PAL signal is selected. When the switch is set to the REG (registration) position, the R, G, B, R-G or B-G signal is selected. The selected signal at pin 4 of IC12 is fed to the pix output connector on the rear of camera through buffer in IC13 and pin 12 of CN5.

The G signal delays slightly comparing with the R and B signal. Therefore, the spike noise appears in the R-G and B-G signal. Q15 is used to remove the front portion of G signal for eliminating the spike noise.

VR14 (-G GAIN) adjusts the negative G signal level to match the positive G signal.

7 Auto Board

The Auto board contains following circuits.

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7-1 AWC/ABC Inhibit Circuit

This Circuit consists of AWC/ABC clock pulse generator circuit and AWC/ABC clock pulse selection circuit.

7-1-1 AWC/ABC clock pulse generator circuit

Outline

This circuit generates the clock pulse for approximately 5 seconds after the Auto White/Auto Black Set Switch on the front of camera is set to the AWC or ABC mode and sends it to the red (R) and blue (B) automatic white and black control circuit through the AWC/ABC clock pulse selection circuit for the automatic white and black balance setting.

Details

- **In case of turning ON the power switch;**

When the power switch is turned ON, the capacitor C1 is momentarily discharged and the potential at pin 1 Ⓕ of NAND gate IC3 becomes low (L) level setting the output of NAND gate at pin 3 Ⓖ becomes high (H) level. This H level is fed to RESET terminal (pin 11) of 12-bit counter IC4 to reset all output of IC4 to the L level. The L level at Q9 output (pin 12) of IC4 is sent to pin 6 Ⓘ of NOR gate IC1. Since the L level generated by capacitor C1 is inverted to the H level and sent to pin 5 Ⓙ of IC1, the output IC1 becomes the L level and it is sent to the input (pin 8 Ⓗ) of R-S flip-flop.

When the Auto White/Auto Black Set Switch is in the HOLD position, the pin 2 Ⓐ of NOR gate IC1 is kept the H level. Therefore, pin 3 Ⓒ of IC1 and pin 3 Ⓔ of IC2 become L and H level respectively. As pin 13 Ⓔ and pin 8 Ⓗ of R-S flip-flop IC3 become H and L level respectively, the output (pin 10 Ⓓ) of R-S flip-flop is initialized to H level. This H level is applied to pin 9 of IC1 and the output at pin 10 Ⓛ becomes L level regardless of clock pulse using the vertical scanning start (Vs) pulse at pin 8 Ⓚ . As a result, the Vs clock pulse is not sent to counter IC4 and the AWC/ABC clock pulse selection circuit.

After for a while the power switch is turned ON, capacitor C1 is charged and the potential at pin 8 Ⓗ of R-S flip-flop is converted from L to H level. However, the state of R-S flip-flop remains as it is.

- **In case of setting the Auto White/Auto Black Set Switch to the AWC or ABC position in the AUTO mode of Auto/Manual Selection Switch;**

When the Auto/Manual Selection Switch is set to the AUTO position, the potential at pin 1 Ⓑ of IC1 becomes L level and the output at pin 3 Ⓒ of IC1 depends upon the other input (pin 2 Ⓐ) of IC1. When the Auto White/Auto Black Set Switch is pressed to the AWC or ABC position, the potential at pin 2 Ⓐ of IC1 becomes L level momentarily and the potential at pin 3 Ⓒ of IC1, pin 3 Ⓔ of IC3 change to H and L level because pin 2 Ⓓ of IC2 initially set to H level, and pin 13 Ⓔ of R-S flip-flop is converted from H to L level. Since another input (pin 8 Ⓗ) of R-S flip-flop remains H level due to resetting of counter IC4 and charging capacitor C1, the state of R-S flip-flop is changed by L level at pin 13 Ⓔ and the output (pin 10 Ⓓ) is converted from H to L level. This L level enters to pin 9 of IC1 and the clock pulse supplied to pin 8 Ⓚ of IC1 is inverted by IC1 and appears at pin 10 Ⓛ. The close pulse at pin 10 Ⓛ is then sent to the clock input (pin 10) of counter IC4 for counting down and the AWC/ABC clock pulse selection circuit respectively.

When the Auto White/Auto Black Set Switch is released, the potential at pin 2 Ⓐ of IC1 returns to H level and pin 3 Ⓔ of IC2 and pin 13 of IC3 in R-S flip-flop also returns to H level. However, the state of R-S flip-flop does not change.

In the counter IC4, the clock pulse fed to pin 10 is counted down and the potential of Q9 output at pin 12 changes from L to H level approximately 5 seconds after the counter starts counting. It is sent to pin 6 Ⓘ of NOR gate IC1 and converted to L level. Since the potential at pin 13 Ⓔ of IC3 is H level and the potential at pin 8 Ⓗ of IC3 is set to L level, the R-S flip-flop changes its state and the potential at the output (pin 10 Ⓓ) is converted from L to H level. This H level goes to pin 9 of NOR gate IC1 and the output at pin 10 Ⓛ of IC1 becomes L level to stop feeding the clock pulse to the AWC/ABC clock pulse selection circuit. While the potential at pin 10 Ⓓ of R-S flip-flop IC3 is kept L level, the flip-flop does not change its state even if the Auto White/Auto Black Set Switch is depressed again. Because the potential at pin 3 Ⓗ of IC2 stays H all the time.

In this way, the clock pulse is fed to the AWC/ABC clock pulse selection circuit as soon as the Auto White/Auto Black Set Switch is depressed to the AWC or ABC position, and it automatically stops to be applied after approximately 5 seconds.

- **In case of setting the Auto/Manual Selection Switch to the MANUAL position;**

When the Auto/Manual Selection Switch on the front of camera is set to the MANUAL position, the potential at pin 1 B of NOR gate IC1 becomes H level. Therefore, the output at pin 3 C of IC1 is held L level regardless of potential at pin 2 A , which is changed from L to H level when the Auto White/Auto Black Set Switch is set to the AWC or ABC position. In this way, the state of circuit remains same as turning ON the power switch and the clock pulse is not sent to the AWC/ABC clock pulse selection circuit when the Selection Switch is in the MANUAL position.

7-1-2 AWC/ABC Clock Pulse Selection Circuit

Outline

This circuit receives the clock pulse from the AWC/ABC clock pulse generator circuit and sends it to the red (R) and blue (B) automatic white control circuit for the automatic white balance setting when the Auto White/Auto Black Set Switch on the front of camera is depressed to the AWC position. When the Switch is set to the ABC position, the clock pulse is only applied to the R and B automatic black control circuit for the automatic black balance setting. This circuit also closes the lens iris in the ABC mode.

Details

- **In case of turning ON the power switch**

When the power switch is turned ON, capacitor C11 which is connected to pin 6 Ⓠ of IC25/collector of Q5 discharges momentarily and pin 6 Ⓠ of R-S flip-flop IC25 becomes low (L) level. Since the potential at pins 8 and 9 Ⓜ of IC25 becomes high (H) level in the HOLD position of the Auto White/Auto Black Set Switch, the potential at another input (pin 1 Ⓞ) of R-S flip-flop IC25 is set to H level at the same time. Therefore, output (pin 4 Ⓡ) of R-S flip-flop becomes H level. This level is sent to pin 8 Ⓡ of NAND gate IC2 directly and pin 5 Ⓤ of IC2 through inverter (between pins 13 and 11 of IC2). In this time, the clock pulse is not fed from the AWC/ABC clock pulse generator circuit to pins 9 and 6 Ⓛ of IC2, but L level. As a result, the potential at pins 10 Ⓣ and 4 Ⓥ becomes H level respectively and no clock pulse is sent to both the automatic white and black control circuit. The output (pin 11 Ⓢ) of NOR gate IC1 is supplied to the lens for controlling the lens iris. Since both inputs (pins 12 Ⓓ and 13 Ⓡ) of IC1 are H level, the output at pin 11 Ⓢ of IC1 becomes L. Therefore, the lens iris is not closed.

The potential at pin 6 Ⓠ of R-S flip-flop IC25 changes from L to H level due to the charge of capacitor C11. However, the state of R-S flip-flop remains same.

- **In case of setting the Auto White/Auto Black Set Switch to the AWC position;**

Even when the Auto White/Auto Black Set Switch is depressed to the AWC position, the potential at pins 8 and 9 Ⓜ of IC25 does not change and stays in H level. Therefore, the state of R-S flip-flop IC25 stays same and the potential at pins 8 Ⓡ and Ⓤ of NAND gate IC2 remains H and L level as in the case of turning ON the power switch. However, in this time, the clock pulse is applied from the AWC/ABC clock pulse generator circuit to pins 9 and 6 Ⓛ of IC2. As a result, the clock pulse obtained at pin 10 Ⓣ of IC2 is fed to the R and B automatic white control circuit for the white balance setting. The pin 4 Ⓥ of IC4 remains H level.

- **In case of setting the Auto White/Auto Black Set Switch to the ABC position;**

When the Auto White/Auto Black Set Switch is depressed to the ABC position, the potential at pins 8 and 9 Ⓜ momentarily becomes L level and the output (pin 11 Ⓞ) of NAND gate IC25 is converted to H to L level. Since one input (pin 6 Ⓠ) of R-S flip-flop IC25 remains H and another input (pin 1 Ⓞ) of R-S flip-flop is converted from H to L level, the R-S flip-flop changes its state and the output (pin 4 Ⓡ) of IC25 becomes L level. Therefore, the potential at pins 8 Ⓡ and Ⓤ of IC2 is inverted to L and H level respectively. At the same time, the clock pulse is fed to pins 9 and 6 Ⓛ of IC2. As a result, the clock pulse obtained at pin 4 Ⓥ of IC2 is supplied to the R and B automatic black control circuit for the black balance setting.

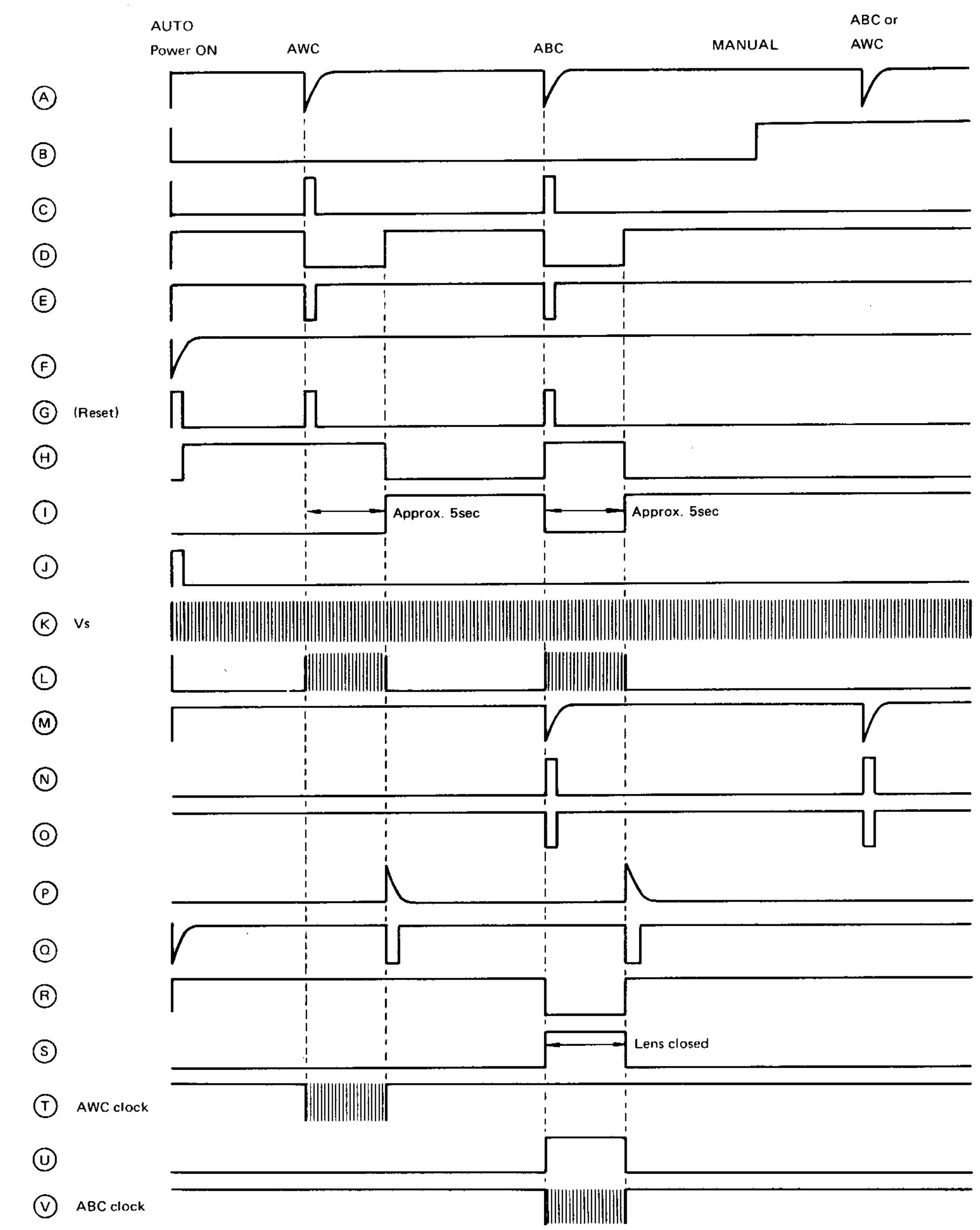
AUTO
Power ON
AWC
ABC
MANUAL
ABC or
AWC
Ⓐ
Ⓑ
Ⓒ
Ⓓ
Ⓔ
Ⓕ
Ⓖ (Reset)
Ⓗ
Ⓘ
Approx. 5sec
Approx. 5sec
Ⓙ
Ⓚ Vs
Ⓛ
Ⓜ
Ⓝ
Ⓞ
Ⓟ
Ⓠ
Ⓡ
Ⓢ
Lens closed
Ⓣ AWC clock
Ⓤ
Ⓥ ABC clock

Fig. 7-1-1 AWC/ABC Inhibit and AWC/ABC Clock Pulse Selection

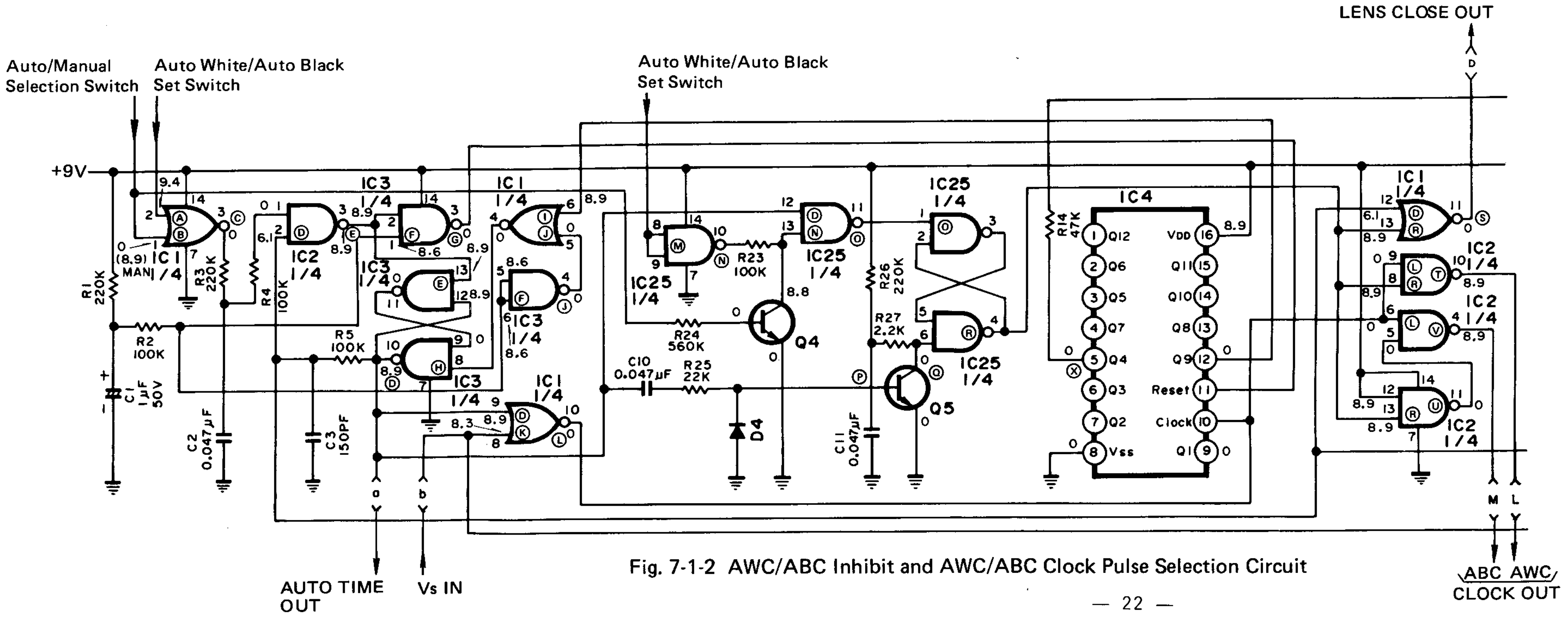
LENS CLOSE OUT
Auto/Manual
Selection Switch
Auto White/Auto Black
Set Switch
Auto White/Auto Black
Set Switch
+9V
IC3 1/4
IC1 1/4
IC25 1/4
IC4
IC2 1/4
R1 220K
R2 100K
R3 220K
R4 100K
R5 100K
C1 1μF 50V
C2 0.047μF
C3 150PF
R23 100K
R24 560K
R25 22K
R26 220K
R27 2.2K
R14 47K
C10 0.047μF
C11 0.047μF
Q4
Q5
D4
VDD
Reset
Clock
Vss
MANI
AUTO TIME
OUT
Vs IN
ABC AWC
CLOCK OUT

Fig. 7-1-2 AWC/ABC Inhibit and AWC/ABC Clock Pulse Selection Circuit

When the Auto White/Auto Black Set Switch is released, the potential at pins 8 and 9 Ⓜ returns to H level and the potential at pin 1 Ⓞ of R-S flip-flop turns to H level. However, the state of R-S flip-flop stays as it is.

Approximately 5 seconds after depressing the Set Switch to the ABC position, the clock pulse is not fed to the pins 9 and 6 Ⓛ of IC2 from the AWC/ABC clock pulse generator circuit. At the same time, the potential at pin 10 Ⓓ of R-S flip-flop IC3 changes from L to H level and fed to the base of Q5 through C10 and R25. The signal Ⓟ obtained at the base of Q5 turns it ON setting the potential at pin 6 of R-S flip-flop IC25 to L level. As a result, the state of R-S flip-flop is inverted to the original mode and its output at pin 4 Ⓡ of IC25 becomes H level.

When the Set Switch is depressed to the ABC position, both inputs (pins 12 Ⓓ and 13 Ⓡ) of IC1 which controls the lens iris become L level. Therefore, H level obtained at pin 11 Ⓢ of IC1 and it is sent to the lens to close the lens iris.

- **In case of setting the Auto/Manual Selection Switch to the MANUAL position;**

When the Auto/Manual Selection Switch is set to the MANUAL position, the base of Q4 is set to H level all the time turning ON Q4. Therefore, the potential at pin 13 Ⓝ of IC25 is kept L level regardless of the potential at pins 8 and 9 Ⓜ of IC25, which is controlled by setting the Auto White/Auto Black Set Switch. As a result, the R-S flip-flop IC25 remains in the original state.

7-2 R/G/B Comparison Circuit

Outline

This circuit compares the level of red (R) and blue (B) signal with that of green (G) signal. The differences among them are converted into the digital signal and sent to the R and B automatic white and black control circuit.

Details

The R, G and B signal which come from the Process-2 board through pins 8, 10 and 7 of CN6 enter the integrator R20/C6, R21/C7 and R22/C8 respectively and converted into the DC voltage corresponding to their signal level.

The R DC voltage is fed to the negative input of comparator IC7 through pin 3 and the G DC voltage to the positive input of IC7 through pin 4. In IC7, they are compared and the resultant signal is then fed through pins 8 and 9 of analog switch IC8 to the counters of R automatic white and black control circuit for the white and black balance setting. If the R DC voltage is higher than the G DC voltage, the output at pin 2 of comparator becomes low (L) level. If the R DC voltage is lower than the G DC voltage, the output of comparator becomes high (H) level.

Similarly the B DC voltage and the G DC voltage are supplied to another comparator in IC7 and they are compared. The resultant signal in the comparison is then fed to the B automatic white and black control circuit through analog switch IC8 as in the case of R and G comparison. If the B signal is higher than the G signal, the output of comparator becomes L level and if the B signal is lower than the G signal, the output of comparator is H level. The analog switch IC8 is switched OFF when the power switch is turned OFF.

7-3 R Automatic White Control Circuit

Outline

This circuit consists of 8-bit counter and digital/analog (D/A) converter. The 8-bit counter receives the clock pulse for approximately 5 seconds from the AWC/ABC inhibit circuit and counts up or down depending upon the signal resulting in the red (R) and green (G) signal comparison in the R/G/B comparison circuit. The outputs from the counter are then converted to the analog (DC) signal by the D/A converter. The converted DC signal is fed to the amplifier for R signal in the Process-1 board to control its gain. The gain-controlled R signal is then compared with the G signal in the R/G/B comparison circuit and the resultant signal is fed back to the 8-bit counter. In this way, the R signal level matches the G signal level automatically within 5 seconds and the white balance is set. The white balance thus set is held for long period of time.

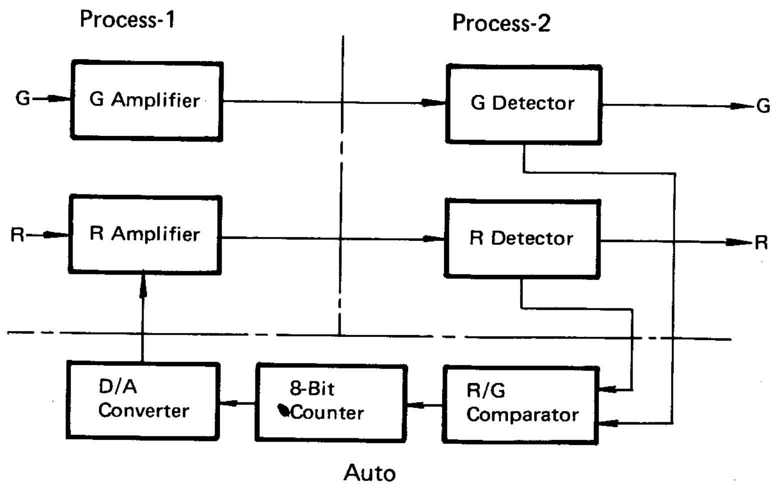

Fig. 7-3-1 Automatic White Control

Details

The output of R and G signal comparison is fed from the R/G/B comparison circuit to pin 10 of 8-bit up/down counter consisting of 4-bit counters IC9 and IC10. When the Auto White/Auto Black Set Switch on the front of camera is depressed to the AWC position, the 50 Hz clock pulse is fed to pin 15 of IC9 and IC10 from the AWC/ABC inhibit circuit through pins 1 and 2 of analog switch IC8 for approximately 5 seconds and the 8-bit counter counts up or down depending upon the potential of comparison output at pin 10 of IC9 and IC10. When the potential at pin 10 is high (H) level, the counter counts up and if it is low (L) level, the counter counts down.

The eight outputs from the 8-bit counter IC9 and IC10 are then sent through analog switch IC11 and IC12 to digital/analog (D/A) converter Z1 and they are converted into the DC voltage. (See Fig. 7-3-2)

The DC voltage thus converted and obtained at pin 10 of Z1 is fed through the DC amplifier in the AWC/ABC control output circuit and pin 16 of CN6 to pin 6 of R amplifier IC4 in the Process-1 board to control the R signal level by changing the gain of amplifier. The gain-controlled R signal level and the G signal level are detected in the Process-2 board and sent to the R and G signal comparator in the R/G/B comparison circuit. The output of comparator is then fed back to the Up/Down terminal (pin 10) of 8-bit counter IC9 and IC10. As a result, the R signal level matches the G signal level automatically within approximately 5 seconds and the white balance setting is accomplished.

The clock pulse stops to be supplied to the 8-bit counter after approximately 5 seconds and the counter stops counting. However, this state is held for long period of time and the DC voltage which makes the R signal same as the G signal is sent to the R amplifier.

If the R signal is lower than the G signal for instance, H level is sent from the R and G comparator to pin 10 of 8-bit counter IC9 and IC10. The counter starts counting up after the Auto White/Auto Black Set Switch is depressed to the AWC position and the clock pulse is applied to pin 15 of counter. The outputs of counter is sent through analog switch IC11 and IC12 to the D/A converter and the output DC voltage from the D/A converter is increased. The increased DC voltage is then fed to the R amplifier in the Process-1 board to increase the R signal level by increasing the gain of R amplifier. In this way, the R signal level coincides the G signal level automatically.

If the R signal is higher than the G signal, the reverse operation takes place.

When the power switch is turned OFF, the backup power is supplied to the 8-bit counter from the backup batteries to hold the state of counter. At the same time, the potential at the control terminals (pins 5, 6, 12 and 13) of analog switches IC8, IC11 and IC12 are switched OFF to disconnect the related circuits from the 8-bit counter. Therefore, the state of 8-bit counter is not changed by the noise from the circuits connected the counter.

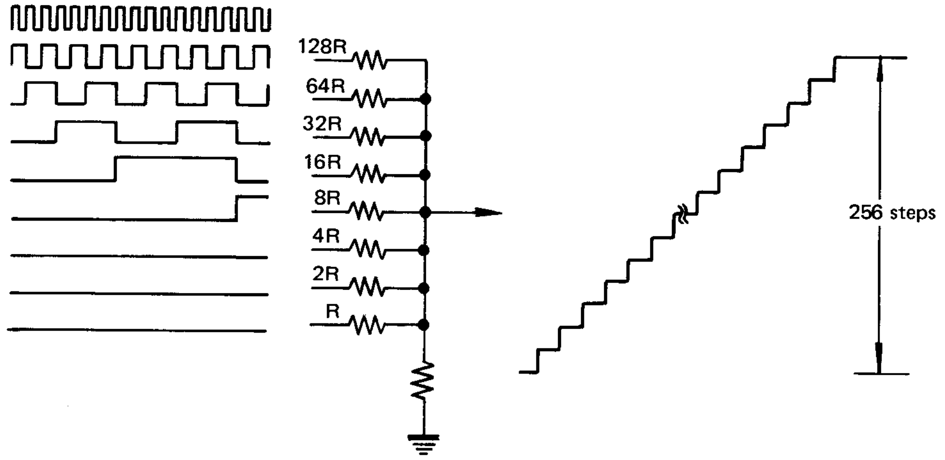

Fig. 7-3-2 D/A Converter

7-4 B Automatic White Control Circuit

Outline

This circuit uses same design as the R automatic white control circuit.

When the Auto White/Auto Black Set Switch is depressed to the AWC position, this circuit generates the DC voltage which controls the B signal level. The DC voltage is sent to the B amplifier in the Process-1 board and controls the B signal level with changing the gain of amplifier. The gain-controlled B signal and the G signal detected in the Process-2 board are compared in the B and G signal comparator and the resultant signal in comparison is fed back to this circuit to make the loop circuit. As a result, the B signal level becomes same as the G signal level automatically and the white balance is set. The white balance thus set is held for long period of time.

Details

The output of B and G signal comparison is fed from the R/G/B comparison circuit to pin 10 of 8-bit up/down counter consisting of IC13 and IC14. When the Auto White/Auto Black Set Switch is depressed to the AWC position, the 50Hz clock pulse is fed to pin 15 of IC13 and IC14 from the AWC/ABC inhibit circuit through pins 1 and 2 of analog switch IC8 for approximately 5 seconds and the 8-bit counter IC13 and IC14 counts up or down depending on the potential of comparison output at pin 10 of IC13 and IC14. When the potential at pin 10 is high (H) level, the counter counts up. When it is low (L) level, the counter counts down.

The eight output from the 8-bit counter IC13 and IC14 are then sent through analog switch IC15 and IC16 to digital/analog (D/A) converter Z2 and they are converted into the DC voltage. The DC voltage thus converted and obtained at pin 10 of Z2 is fed through the DC amplifier in the AWC/ABC control output circuit and pin 17 of CN6 to pin 6 of B amplifier IC6 in the Process-1 board to control the B signal level by changing the gain of amplifier. The gain-controlled B signal level and the G signal level are detected in the Process-2 board and sent to the B and G signal comparator in the R/G/B comparison circuit. The output of comparator is then fed back to the Up/Down terminal (pin 10) of 8-bit counter IC13 and IC14. As a result, the B signal level matches the G signal level automatically within 5 seconds and the white balance setting is accomplished. The clock pulse stops to be supplied to the 8-bit counter after 5 seconds and the counter stops counting. However, the state of counter is held for long period of time and the DC voltage which makes the B signal same as the G signal is sent to the B amplifier. As a result, the white balance is held. When the power switch is turned OFF, the backup power is fed to the 8-bit counter from the backup batteries to hold the state of counter. At the same time, the potential at the control terminals (pin 5, 6, 12 and 13) of analog switches IC8, IC15 and IC16 becomes L level switching OFF the analog switches and disconnecting the related circuits from the counter for preventing the counter to change its state with the noise comes from the related circuits.

7-5 R Automatic Black Control Circuit

Outline

This circuit consists of 8-bit counter and digital (D/A) converter and operate as in the case of the R automatic white control circuit.

The 8-bit counter receives the clock pulse for approximately 5 seconds from the AWC/ABC inhibit circuit after Auto White/Auto Black Set Switch is depressed to the ABC position and counts up or down depending upon the signal from the R/G/B comparison circuit. The outputs from the counter are then converted to the analog (DC) signal by the D/A converter. The DC signal is fed to the R pedestal setting circuit in the Process-1 board to control the black level. The R black level set is then compared with that for the G signal in the R/G/B comparison circuit and the resultant signal is fed back to the 8-bit counter. In this way, the R pedestal level matches the G pedestal level automatically within 5 seconds after the Set Switch is depressed to the ABC position and the black balance is set. The black balance thus set is held for long period of time.

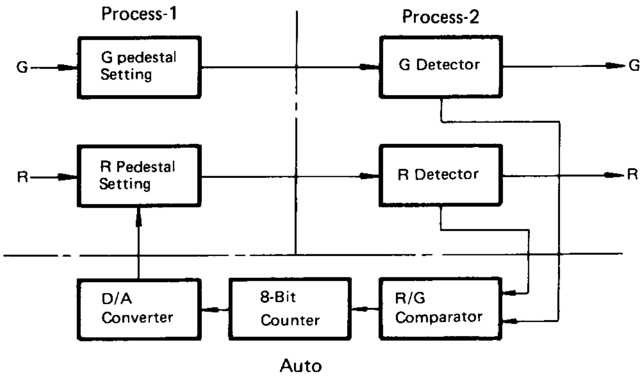

Fig. 7-5-1 Automatic Black Control

Details

The output of R and G black level comparison from the R/G/B comparison circuit is sent to pin 10 of 8-bit up/down counter consisting of two 4-bit counters IC17 and IC18. (When the Auto White/Auto Black Set Switch is depressed to the ABC position for the black balance setting, the lens iris is closed automatically. Therefore, the black levels of the R and G signal are compared in the R/G/B comparison circuit.) When the Set Switch is depressed to the ABC position, the 50Hz clock pulse is fed to pin 15 of IC17 and IC18 from the AWC/ABC inhibit circuit through pins 4 and 3 of analog switch IC8 for approximately 5 seconds and the 8-bit counter counts up or down depending upon the potential of comparison output at pin 10 of IC17 and IC18. When the potential at pin 10 is high (H) level, the counter counts up and if it is low (L) level, the counter counts down.

The eight outputs from the counter IC17 and IC18 are then sent through analog switch IC19 and IC20 to digital/analog (D/A) converter Z3 and they are converted into the DC voltage as in the case of the R automatic white control circuit.

The DC voltage thus converted and obtained at pin 10 of Z3 is fed through the DC amplifier in the AWC/ABC control output circuit and pin 18 of CN6 to the R pedestal setting circuit in the Process-1 board to control the R black level by changing the clamp potential of clamp circuit Q24. The R black level and the G black level are detected in the Process-2 board and sent to the R and G signal comparator. The output of comparator is then fed back to the Up/Down terminal (pin 10) of 8-bit counter IC17 and IC18. As a result, the R black level matches the G black level automatically within approximately 5 seconds and the black balance setting is accomplished.

The clock pulse stops to be supplied to the 8-bit counter after 5 seconds and the counter stops counting. However, this state of counter is held for long period of time and the DC voltage which makes the R back level same as the G black level is fed to the clamp circuit for the black balancing.

If the R black level is lower than the G black level for example, H level is sent from the R and G comparator to pin 10 of 8-bit counter IC17 and IC18. The counter starts counting up after the Auto White/Auto Black Set Switch is depressed to the ABC position and the clock pulse is applied to pin 15 of counter. The outputs of counter are sent through analog switch IC19 and IC20 to the D/A converter and the output DC voltage from the D/A converter is increased. The increased DC voltage is then fed to the clamp circuit for the R signal to go up the clamp potential. In this way, the R black level becomes same as G black level automatically.

If the R black level is higher than the G black level, the reverse operation takes place.

When the power switch is turned OFF, the backup power is supplied to the 8-bit counter from the backup batteries to hold the state of counter. At the same time, the potential at the control terminals (pins 5, 6, 12 and 13) of analog switch IC8, IC19 and IC20 become L level switching OFF the analog switches and disconnecting the related circuits from the 8-bit counter. Therefore, the state of 8-bit counter is not changed by the circuits previously connected to the counter.

7-6 B Automatic Black Control Circuit

Outline

This circuit operates as in the case of R automatic black control circuit.

When the Auto White/Auto Black Set Switch is depressed to the ABC position, this circuit generates the DC voltage which controls the black level of blue (B) signal. The DC voltage is sent to the B pedestal setting circuit in the Process-1 board to control the black level. The B black level set is then compared with that for the G signal in the R/G/B comparison circuit and the resultant signal is fed back to this circuit. In this way, the B black level matches the G black level automatically within 5 seconds after the Set Switch is depressed to the ABC position and the black balance is set. The black balance thus set is held for long period of time.

Details

The output of B and G black level comparison from the R/G/B comparison circuit is sent to pin 10 of 8-bit counter consisting of two 4-bit counters IC21 and IC22. (When the Auto White/Auto Black Set Switch is depressed to the ABC position for black balance setting, the lens iris is automatically closed. Therefore, the black levels of the B and G signal are compared in the R/G/B comparison circuit.) When the Set Switch is depressed to the ABC position, the 50Hz clock pulse is fed to pin 15 of IC21 and IC22 from the AWC/ABC inhibit circuit through pins 4 and 3 of analog switch IC8 for approximately 5 seconds and the 8-bit counter counts up or down depending upon the potential of comparison output at pin 10 of IC21 and IC22. When the potential at pin 10 is high (H) level, the counter counts up and if it is low (L) level, the counter counts down. The eight outputs from the 8-bit counter IC21 and IC22 are then supplied through analog switch IC23 and IC24 to digital/analog (D/A) converter Z4 and they are converted into the DC voltage as in the case of the R automatic white control circuit. The DC voltage thus converted and obtained at pin 10 of Z4 is fed through the DC amplifier in the AWC/ABC control output circuit (which will be explained in the next) and pin 19 of CN6 to the B pedestal setting circuit in the Process-1 board to control the B black level by changing the clamp potential of clamp circuit Q36. The B black level and the G black level detected in the Process-2 board are sent to the B and G signal comparator in the Auto board. The output of comparator is then fed back to the Up/Down terminal (pin 10) of 8-bit counter IC21 and IC22 and the loop circuit is made. As a result, the B black level matches the G black level automatically within approximately 5 seconds and the black balance setting is accomplished.

The clock pulse stops to be supplied to the 8-bit counter after 5 seconds and the counter stops counting. However, the state of counter is held for long period of time and the DC voltage which makes the B and G black level same is sent to the clamp circuit for the black balancing. As a result, the black balance is maintained.

When the power switch is turned OFF, the backup power is applied to the 8-bit counter from the backup batteries to hold the state of counter. At the same time, the potential at the control terminals (pin 5, 6, 12 and 13) of analog switches IC8, IC23 and IC24 become L level switching OFF the analog switches and disconnecting the related circuits from the counter. As a result, the counter does not change its state with the noise comes from the related circuit and the black balance previously set is kept.

7-7 AWC/ABC Control Output Circuit

Outline

This circuit receives the DC voltages, which automatically sets and keeps the white and black balance, from the R and B automatic white and black control circuit and sends then to the Process-1 board. The DC voltage for the R white balance setting is also fed to the color conversion warning circuit for controlling the color conversion warning (CCW) indicator LED in the 1.5 inch viewfinder.

Details

The DC voltage obtained at pin 10 of digital/analog (D/A) converter Z1 in the R automatic white control circuit is sent to the DC amplifier connected between pins 5 and 7 of IC6. The DC voltage at pin 7 of IC6 is then fed through pin 16 of CN6 to the Process-1 board for controlling the red (R) signal level for the automatic white balance setting. The DC voltage at pin 7 of IC6 is also supplied to pins 7 and 8 of IC5 in the color conversion warning/backup control circuit for controlling the CCW indicator in the viewfinder.

The DC voltage obtained at pin 10 of D/A converter Z2 in the B automatic white control circuit is sent through DC amplifier connected between pins 10 and 8 of IC6 and pin 17 of CN6 to the Process-1 board for setting the blue (B) signal level for the automatic white balance setting. The DC voltage obtained at pin 10 of D/A converter Z3 in the R automatic black control circuit is fed through DC amplifier connected between pins 12 and 14 of IC6 and pin 18 of CN6 to the Process-1 board for setting the R black level for the automatic black balance setting. The DC voltage obtained at pin 10 of D/A converter Z4 in the B automatic black control circuit is fed through DC amplifier connected between pins 3 and 1 of IC6 and pin 19 of CN6 to the Process-1 board for setting the B black level for the automatic balance setting.

7-8 Color Conversion Warning/Backup Control Circuit

7-8-1 Color Conversion Warning Circuit

Outline

This circuit drives the color conversion warning (CCW) indicator LED in front of 1.5 inch viewfinder. The CCW indicator flashes when the white balance or black balance is being set automatically and goes OFF when the white balance or black balance setting is accomplished. When the automatic white balance is set incorrectly, the CCW indicator lights.

Details

- **In case the Auto White/Auto Black Set Switch is depressed ;**

When the Auto White/Auto Black Set Switch on the front of camera is depressed, the potential at pin 11 of comparator IC5 becomes low (L) level for approximately 5 seconds and the output of comparator at pin 13 becomes L level. Therefore, the vertical scanning start (Vs) pulse which is supplied through pin 20 of CN6 to R15 is grounded through R15, and the pulse whose frequency is approximately 3Hz and obtained at pin 5 (Q4 output) of counter IC4 is sent through R14 and pin 15 of CN6 to the 1.5 inch viewfinder. As a result, the CCW indicator LED flashes to indicate the camera operator that the white balance or black balance is being set automatically.

- **In case the white balance is set correctly ;**

The DC voltage which controls the red (R) signal level for automatic white balance is fed from the AWC/ABC control output circuit to pins 7 and 8 of comparator IC5. This DC voltage is compared with the reference DC voltages which are generated by dividing +9V with R7 - R10 and sent to pins 6 and 9 of comparator IC5.

When the white balance is set correctly, the DC voltage fed to pins 7 and 8 of IC5 is between tow reference DC voltages at pins 6 and 9 of IC5. Therefore, both outputs of comparator at pins 1 and 14 become high (H) level to turn ON Q3 and the its collector is grounded. As a result, the Vs pulse is grounded through R15, no signal is fed to the viewfinder and the CCW indicator goes OFF indicating the camera operator that the white balance is set correctly. When the white balance setting is completed, the counter IC4 in the AWC/ABC inhibit circuit is reset and no output is generated at pin 5 of IC4.

- **In case the white balance is set incorrectly ;**

If white balance is set while aiming the camera at the colorful object or setting the color temperature conversion filter to the wrong position, the DC voltage supplied to pins 7 and 8 of IC5 becomes higher than the reference DC voltage at pin 9 of IC5 or lower than the reference DC voltage at pin 6 of IC5. Therefore, either output of comparator becomes L level turning OFF Q3.

As a result, the Vs pulse is supplied to the viewfinder and the CCW indicator lights for indicating the camera operator that the white balance is set incorrectly and correct white balance setting is required.

7-8-2 Backup Control Circuit

Outline

This circuit detects turning OFF the power switch and sends the backup power to the R and B automatic white and black control circuit to keep the white balance and black balance previously set.

Details

The DC voltage generated by dividing +9V with R7 - R10 is fed to pin 5 of comparator IC5, where it is compared with the 6.8V reference DC voltage generated by D1 and supplied to pin 4 of IC5. In the operating condition, the DC voltage at pin 5 is higher than the reference DC voltage at pin 4 and the output of comparator at pin 2 of IC5 becomes high (H) level. The H level is then applied to the base of Q2 to turn ON Q2 and Q1. As a result, +9V DC is fed to the R and B automatic white and black control circuit through Q1. At this time, the +3V backup power supplied to the anode of D4 from the backup batteries is not supplied to the circuits since D4 is turned OFF by the +9V at its cathode.

When the power switch is turned OFF, the DC voltage at pin 5 of IC5 becomes lower than the reference DC voltage at pin 4 and the output of comparator changes from high (H) to low (L) level. The L level turns OFF Q2 and Q1, and +9V is not sent through Q1 to the R and B automatic white and black control circuit. At this time, D4 is turned ON and the +3V backup power from the backup batteries is sent through D4. As a result, the state of white balance and black balance previously set is held even when the power switch is turned OFF.

When the power switch is turned OFF, the L level of comparator output at pin 2 of IC5 is also sent to the R and B automatic white and black control circuit for switching OFF the analog switches.

8 Sync-1 Board

The Sync-1 Board contains following circuits.

Page

8-1 Sync Generator Circuit 28

8-2 Subcarrier Signal Circuit 29

8-3 R-Y(V) SC Signal Circuit 30

8-1 Sync Generator Circuit

Outline.

This circuit generates all sync signals used in the camera in the internal sync mode. The subcarrier signal is not generated in this circuit in the gen-lock/external sync mode.

Details

In the internal sync mode, the high potential is sent to the base of Q8 and Q9 to turn them OFF and the 8.86 MHz oscillator circuit consisting of crystal oscillator X1, Q7 and CT1 (4.43 MHz ADJ), and the 2.5 MHz oscillator consisting of crystal oscillator X2, D3 and CT2 (PHASE LOCK ADJ) work properly.

The 8.86 MHz frequency signal at the collector of Q7 is sent to pin 5 of sync generator IC6. In IC6 the 8.86 MHz frequency signal and the 2.5 MHz frequency signal supplied to pin 15 of IC6 are compared in phase and the phase difference is converted into the DC voltage.

The DC voltage corresponding to the phase difference is sent to the 2.5 MHz voltage controlled oscillator (VCO) to control the oscillating frequency by changing the capacitance of variable capacitance diode D3. The frequency-controlled signal is then fed to IC6 through pin 15 and it is compared with the 8.86 MHz in phase. In this way, the phase lock loop (PLL) is made and pulses locked with the subcarrier signal are generated from the IC6 respectively.

In the gen-lock/external sync mode, the low level is fed to the base of Q8 and Q9 to turn them ON. Therefore the 8.86 MHz and 2.5 MHz VCO stop oscillating the 8.86 MHz and 2.5 MHz frequency signals. In the internal sync mode, the potential at select input (pin 13) of IC6 becomes high level and signal at pin 15 is selected as a input of IC6. In the gen-lock/external sync mode, the potential at pin 13 is low level and the 2.5 MHz fed from the Sync-2 board is selected as a input of IC6. The vertical reset pulse is applied to pin 11 of IC6 to reset IC6 vertically in the gen-lock/external sync mode. The 4.43MHz subcarrier (SC) signal obtained at pin 4 of sync generator IC6 is sent to the subcarrier signal circuit through buffer Q10.

The horizontal drive (HD) pulse obtained at pin 21 of IC6 is fed to other circuits through inverter connected between pins 12 and 11 of IC1, HD output Q4/Q5 and pin 18 of CN7 (Ⓐ).

The HD pulse is also fed to pin 4 of monostable multivibrator IC3 where the horizontal blanking (H BL) pulse is generated.

The HD pulse is sent through pin 4 of IC4 to the monostable multivibrator where the H encoder BL pulse is generated. The encoder BL pulse Ⓑ obtained at pin 7 of IC4 is sent to NAND gate in IC1 through pin 6 and it is mixed with the V BL pulse supplied to pin 5 to make a composite encoder BL pulse. The composite encoder BL pulse at pin 4 of IC1 is applied to other circuits through pin 6 of CN7. VR2 (ENCODER BLANKING) is a control for setting the width of H encoder BL pulse.

The HD pulse is fed through pin 12 of monostable multivibrator IC4 where preblanking (pre BL) pulse is generated. The pre BL pulse Ⓒ at pin 9 of IC4 is sent to NAND gate in IC1 through pin 1 and it is mixed with the V BL pulse supplied to pin 2 to make a composite pre BL pulse. The composite pre BL pulse at pin 3 of IC1 is fed to other circuits through pin 13 of CN7. VR1 (PRE BLANKING) is a control for adjusting the width of pre BL pulse.

The HD pulse is sent to pin 12 of monostable multivibrator IC3 where the clamp pulse (CP) is generated. First monostable multivibrator in IC3 sets the phase of CP and second one sets the width of CP. The CP Ⓓ obtained at pin 6 of IC3 is sent to other circuits through CP output Q3 and pin 9 of CN7.

The composite blanking (BL) pulse Ⓔ obtained at pin 22 of IC6 is sent through inverters in IC2 and pin 5 of CN7 to other circuits.

The composite sync pulse at pin 19 of IC6 is fed through inverter connected between pins 8 and 10 of IC1 and pin 7 of CN7 to other circuits (Ⓕ).

The burst flag pulse (BFP) obtained at pin 20 of IC6 is supplied to other circuits through pin 8 of CN7 (Ⓖ).

The vertical drive (VD) pulse Ⓗ obtained at pin 10 of IC6 is fed to monostable multivibrator through pin 4 of IC5 to make the vertical BL pulse. The V BL pulseⒾat pin 7 of IC5 is sent to IC1 and mixed with the encoder BL and pre BL pulses to make the composite pulses.

The sync pulse obtained at pin 19 of IC6 is also fed to pin 12 of monostable multivibrator IC5 where the vertical scanning start (Vs) pulse is generated. The Vs pulse Ⓙ obtained at pin 9 of IC5 is fed to other circuits through Vs output Q1/Q2 and pin 20 of CN7.

The Vs pulse obtained at pin 10 of IC5 is sent to monostable multivibrator consisting of NOR gates in IC2 to make a vertical camera BL pulse. The V camera BL pulse Ⓚ at pin 11 of IC2 is sent through pin 19 of CN7 to other circuits.

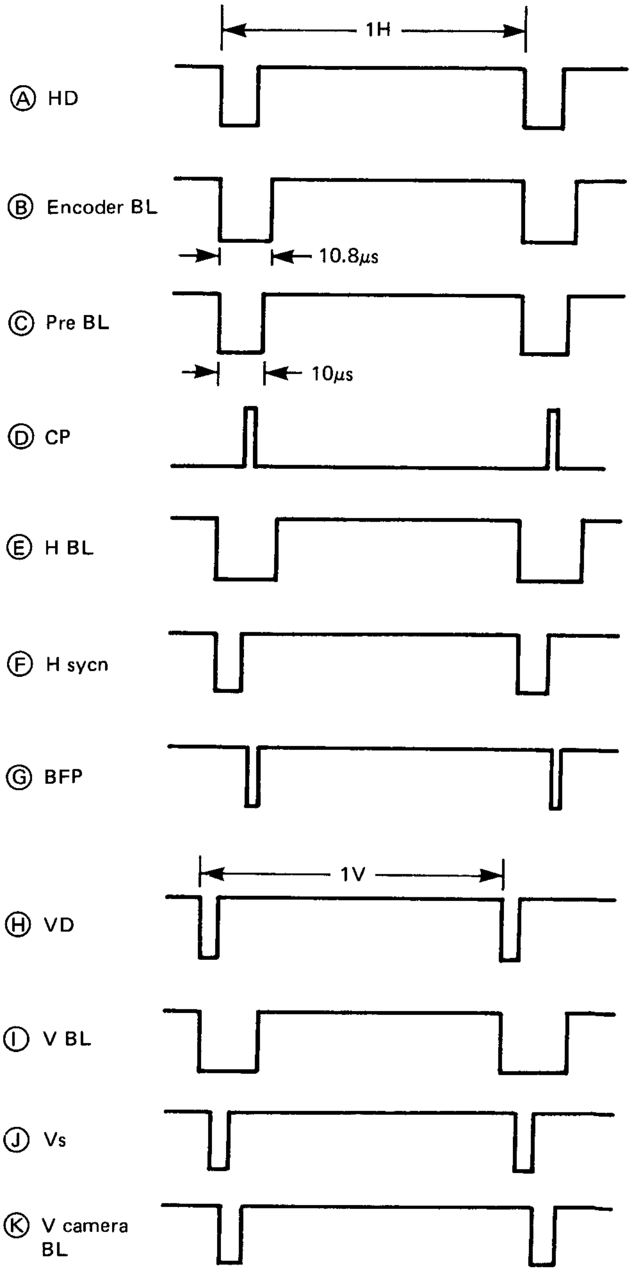

Fig. 8-1-1 Pulses

8-2 Subcarrier Signal Circuit

Outline

This circuit receives the subcarrier (SC) signal supplied form.the sync generator or the Sync-2 board and sends it to other circuit after phase-shifting the SC signal.

Details

The SC signal generated in the sync generator circuit is fed to pin 1 of analog switch IC8. The SC signal generated in the Sync-2 board in the gen-lock/external sync mode is fed through pin 2 of CN7 to pin 2 of IC7. In the internal sync mode, the potential at control terminal (pin 10) of IC7 becomes high (H) level and the SC signal supplied to pin 1 is selected. In the gen-lock/external sync mode, the SC signal fed to pin 2 is selected since the potential at pin 10 of IC7 becomes low (L) level. The selected SC signal obtained at pin 15 of IC7 is fed to pin 1 of SW1 (SC PHASE COARSE SWITCH) and 120° phase shifter through pin 1 of IC9. The SC signal whose phase is shifted 120° by the phase shifter is applied to pin 2 of SW1 and another 120° phase shifter. The SC signal whose phase is shifted 240° by two 120° phase shifter is sent to pin 4 of SW1. The SC signal obtained at pin 3 of SW1 is then applied through pin 12 of IC9 to the 120° phase shifter where its phase is shifted from 0° to 120° continuously by VR5 (SC PHASE FINE). As a result, the SC phase is shifted more than 360° by use of SW1 and VR5. The SC signal thus shifted its phase is applied to the limiter which limits the SC signal level and the SC signal whose level is kept constant regardless of input SC signal level. The SC signal at pin 27 of IC9 is then sent to buffer Q11 through the 4.43 MHz band pass filter (BFP) consisting of L4, L5, C37 and C40, where the harmonics of SC signal is removed and the sine wave SC signal is detected. The SC signal obtained at the emitter of Q11 is fed to other circuit through pin 21 of CN7 and the R-Y(V) SC circuit.

In the internal sync mode, potential at control terminal (pin 9) of analog switch IC8 becomes H level and H level (+9V) at pin 3 of IC8 is fed to 8.86 MHz and 2.5 MHz oscillator circuit to oscillate 8.86MHz and 2.5 MHz frequency internally. However, L level (0V) at pin 5 of IC8 is sent to both the oscillator circuits to stop oscillating internal 8.86 MHz and 2.5 MHz frequency since the potential at pin 9 of IC8 becomes L level.

In the gen-lock/external sync mode, when the camera is used with the remote control unit (RCU), the potential at control terminal (pin 11) of IC8 becomes L level and H phase of video signal is controlled by the DC voltage supplied to pin 12 of IC8 from the H phase control in the RCU. When the RCU is not used, the potential at pin 11 of IC8 becomes H level and H phase of video signal is set by the DC voltage adjusted by VR4 (H PHASE).

8-3 R-Y(V) SC Signal circuit

Outline

This circuit generates the subcarrier signal for modulating R-Y(V) color difference signal.

Details

The subcarrier (SC) signal Ⓐ is sent from the subcarrier signal circuit to pin 2 of balance modulator IC7 where it is modulated by the PAL pulse Ⓑ fed to pin 1 of IC7. The SC signal Ⓒ whose phase is inverted by line and obtained at pin 7 of IC7 is sent to other circuits through pin 17 of CN7 as a R-Y(V) subcarrier.

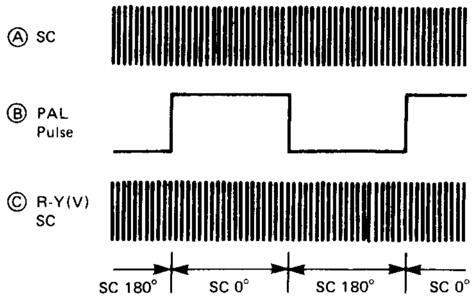

Fig. 8-3-1 R-Y(V) SC Signal

9 Sync-2 Board

The Sync-2 board contains following circuits.

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9-1 Sync Separation Circuit 30
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9-6 Vertical Separation Circuit 32
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9-8 Vertical Reset Pulse Circuit 33
9-9 Gen-Lock/External Subcarrier Circuit 33
9-10 +9V DC Regulator Circuit 33
9-11 Battery Warning Circuit 34

9-1 Sync Separation Circuit

Outline

This circuit receives the black burst signal supplied to the GEN-LOCK connector on the rear of camera or on the remote control unit (RCU). The sync signal which is separated from the black burst signal in this circuit is sent to the gen-lock detection circuit, the gen-lock H phase circuit, the vertical separation circuit and the burst gate pulse circuit.

Details

The black burst signal supplied to the GEN-LOCK connector on the rear of camera or the RCU is fed through pin 19 of CN8, buffer Q1 and gain control Q2 to amplifier Q3. When the black burst signal is supplied from the RCU through the 32-pin camera cable, the level of black burst signal is reduced due to the length of camera cable. Q2 compensates the reduction of the burst signal level. If the RCU is not connected, the potential at the base of Q2 becomes high(H) level to turn OFF Q2. Therefore, the R6 is connected between Q1 and R7. However, if the RCU is used and the VTR-RCU Selector Switch is set to the RCU position, the base potential of Q2 becomes low(L) level turning it ON. As a result, R6 is shorted and the black burst level is increased slightly.

The amplified black burst signal obtained at the collector of Q3 is fed through buffer Q4 to sync separator Q5 where the sync signal is separated from the black burst signal. The separated sync signal at the collector of Q5 is supplied to the gen-lock detection circuit, the gen-lock H phase circuit, the burst gate pulse circuit and the vertical separation circuit.

The black burst signal obtained at the emitter of Q4 is fed to the burst gate circuit.

9-2 Gen-Lock Detection Circuit

Outline

This circuit detects the sync signal supplied from the sync separation circuit and converts it to the DC potential. This DC potential sets the sync generator circuit in the Sync-1 board from the internal sync mode to the gen-lock/external sync mode.

Details

The separated signal is fed from the sync separation circuit to rectifier consisting of D2, R47 and C16 which converts it into the DC voltage. The DC voltage is sent to the base of detector Q12 turning ON Q12 and power switching Q13. As a result, +9V power at the emitter of Q13 is supplied to the circuits related to the gen-lock/external sync mode. The low (L) level at the collector of Q12 is fed to the sync generator circuit in the Sync-1 board through pin 10 of CN8 to change it to the gen-lock/external sync mode.

9-3 Gen-Lock H phase and Gen-Lock 2.5 MHz Oscillator Circuit

Outline

When the black burst signal is supplied to the GEN-LOCK connector, this circuit detects the horizontal(H) sync pulse from the black burst signal. The H sync pulse is compared with the horizontal drive (HD) pulse (generated in the sync generator) in phase and converted into the DC voltage which controls the voltage-controlled oscillator (VCO) to oscillate the 2.5 MHz frequency. It is sent to the sync generator circuit in the Sync-1 board to generate the pulses used in the camera. In this way, the loop circuit is made in the gen-lock/external sync mode and the 2.5 MHz frequency is controlled to generate the HD pulse whose phase coincides with that of gen-lock black burst signal.

Details

The sync signal Ⓐ separated from the black burst signal is supplied through pin 6 of IC1 to monostable multivibrator consisting of NOR gate and inverter in IC1, where the equalizing and serration pulses are removed and vertical(V) sync component is removed and only the H sync pulse Ⓑ remains.

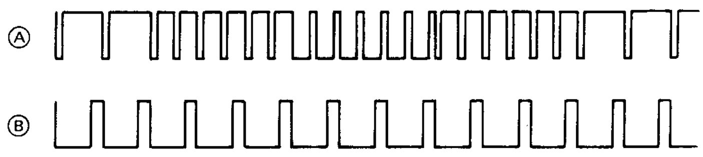

Fig. 9-3-1 $2f_H$ Elimination

The H sync pulse thus detected at pin 9 of IC5 is fed to pin 14 of phase comparator IC6. The HD pulse is applied through pin 18 of CN8 and pin 15 of IC1 to monostable multivibrator consisting of NAND gate and inverter in IC1, which generates the phase-shifted H pulse. The H pulse obtained at pin 11 of IC1 is then fed to pin 3 of IC6 where it is compared with the H sync pulse supplied to pin 14 and a pulse whose width corresponds to the phase difference between two pulses is generated at pins 9 and 13. The pulse is converted to the DC voltage by the low pass filter consisting of R69, C42 and C43. This DC voltage is fed to the 2.5 MHz voltage controlled oscillator (VCO) consisting of D4, CT1 (H LOCK), L5, C44, C45, C47 and Q17 and controls the oscillating frequency by changing the capacitance of variable capacitance diode D4.

The 2.5 MHz frequency is fed back to the sync generator circuit in the Sync-1 board through buffer Q18 and pin 17 of CN8 to generate the HD pulse. The HD pulse is supplied to monostable multivibrator through pin 15 of IC1. In this way, a phase lock loop (PLL) circuit is made and the frequency of 2.5 MHz VCO is controlled in order to generate the HD pulse whose relative phase matches that of H sync pulse of black burst signal. CT1 (H LOCK) is a control for setting the lock-range of the PLL circuit.

The relative phase between the HD pulse and H sync pulse of burst signal is adjusted with the DC voltage supplied through pin 13 of CN8. If the HD pulse is delayed, the phase of HD pulse generated from the sync generator is forwarded. It is used to eliminate a horizontal phase difference between cameras caused by a difference in cable length when mixing the output of multiple camera.

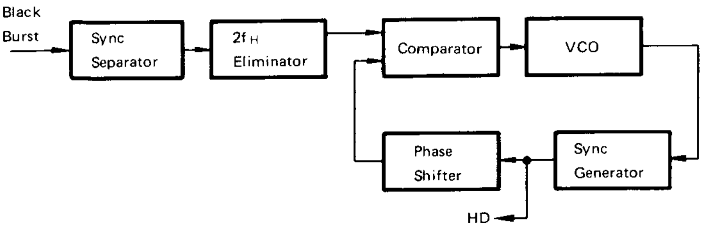

Fig. 9-3-2 Gen-Lock 14MHz Oscillator

9-4 Burst Gate Pulse Circuit

Outline

This circuit generates the burst gate pulse for gating the burst signal on the black burst signal. The burst gate pulse is sent to the burst gate circuit and the field detect circuit.

Details

The separated sync in the sync separation circuit is fed through pin 5 of IC2 to monostable multivibrator where the burst gate pulse is generated. The burst gate pulse obtained at pin 7 of IC2 is then forwarded to the burst gate circuit. The burst gate pulse at pin 6 of IC2 is sent to the field detect circuit. VR1 (BURST GATE PULSE) is a control for adjusting the width of the burst gate pulse.

9-5 Burst Gate Circuit

Outline

This circuit detects the burst signal from the gen-lock black burst signal supplied from the sync separation circuit and it to the field detect circuit and the gen-lock-/external subcarrier circuit.

Details

The gen-lock burst signal Ⓐ is fed from the sync separation circuit to burst gate consisting of Q8 and Q9 where the burst signal is gated by the burst gate pulse Ⓑ. The gated burst signal Ⓒ at the collector of Q8 is sent to the field detect circuit and the gen-lock/external subcarrier circuit through amplifier Q10 and buffer Q11.

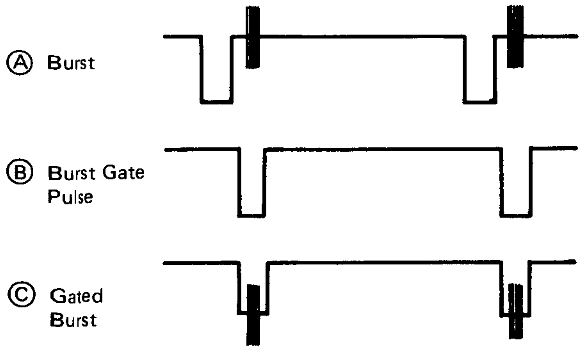

Fig. 9-5-1 Burst Gate

9-6 Vertical Separation Circuit

Outline

This circuit generates the vertical pulse from the sync signal of the gen-lock black burst signal and sends it to the field detect circuit.

Details

The sync signal is supplied from the sync separation circuit to the integrator consisting of R48 and C18 where the horizontal sync signal is removed and only the vertical(V) sync signal is detected. The V sync signal is then fed to monostable multivibrator in IC4 through pin 12 to make the V pulse. The V pulse at pin 9 and pin 10 of IC4 is sent to the field detect circuit.

9-7 Field Detect Circuit

Outline

THis circuit generates the pulse whose phase corresponds the third field of the gen-lock black burst signal. This pulse is sent to the vertical reset pulse circuit to make the vertical reset pulse which reset the sync generator.

Details

The vertical(V) pulse Ⓐ is supplied from the vertical separation circuit to the monostable multivibrator in IC2 through pin 12 to generate the third field detection pulse. The third field detection pulse Ⓑ obtained at pin 10 of IC2 is sent to third field detection circuit IC3. VR2 (FIELD DETECT) is a control to adjust the pulse width of third field detection pulse.

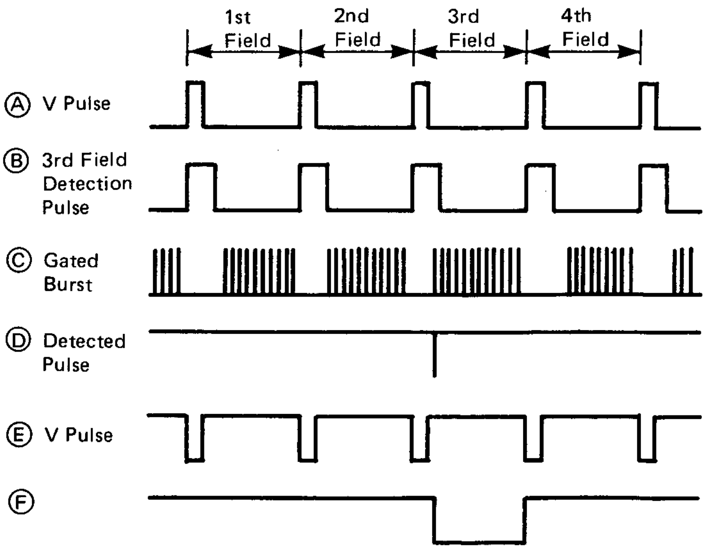

Fig. 9-7-1 Field Detection

The gated burst signal Ⓒ is applied from the burst gate circuit to another burst gate using NAND gate through the low pass filter (LPF) consisting of C11 and L1, inverter Q6 and pin 10 of IC3. In the burst gate, the burst signal is gated by the burst gate pulse supplied to pin 9 of IC3. The gated burst signal obtained at pin 8 of IC3 is fed through inverter Q7 and pin 13 of IC3 to the third field detection circuit. The pulse corresponding to the first burst signal on the third field is detected by the third field detection pulse Ⓑ.
The detected pulse Ⓓ at pin 11 of IC3 is fed to R-S flip-flop in IC3 through pin 5. The vertical pulse Ⓔ is also fed to the R-S flip-flop through pin 1 and the pulse Ⓕ whose frequency is a quarter of the vertical frequency and width corresponds to the third field is obtained at pin 3 of IC3. This pulse is supplied to the vertical reset pulse circuit for making reset pulse.

9-8 Vertical Reset Pulse Circuit

Outline

This circuit makes the vertical reset pulse from the pulse sent from the field detect circuit in the gen-lock/external sync mode and sends it to the sync generator circuit in the Sync-1 board to reset the sync generator circuit vertically.

Details

The pulse Ⓐ whose frequency is a quarter of vertical frequency (12.5 Hz) and pulse width is one vertical period is fed from the field detect circuit to monostable multivibrator in IC4 through pin 4 to make the vertical (V) reset pulse corresponding to the 4th field. The V reset pulse Ⓑ obtained at pin 7 of IC4 is sent to the sync generator circuit in the Sync-1 board through pin 16 of CN8 to reset the sync generator vertically.

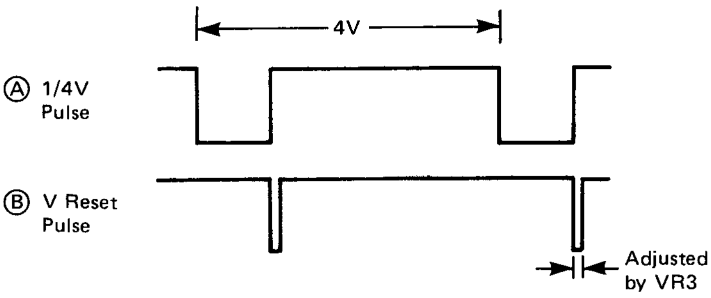

Fig. 9-8-1 Vertical Reset Pulse

9-9 Gen-Lock/External Subcarrier Circuit

Outline

In the gen-lock/external sync mode, this circuit generates the subcarrier (SC) signal which is synchronized with the burst signal of gen-lock black burst signal.

Details

The gated burst signal Ⓐ in the burst gate circuit is fed to the odd-burst detector Q14. The PAL pulse Ⓑ is sent to the base of Q14 and the odd-burst signal Ⓒ is detected.
The odd-burst signal Ⓒ thus detected is fed to pin 6 of subcarrier lock circuit IC5 through the low pass filter (LPF) consisting of L3, C25 and C26 which removes the harmonics and the sine wave burst signal is made. The burst signal applied to pin 6 of IC5 locks the 4.43 MHz oscillator consisting of crystal oscillator X1, C36 - C38 and VR4 (COLOR LOCK), and the SC signal locked by the burst signal is obtained at pin 14 of IC5. The SC signal is supplied through buffer Q16 and pin 2 of CN8 to the subcarrier signal circuit in the Sync-1 board. The H sync pulse is fed through the differential circuit consisting of C27 and R61 to pin 10 of IC5 for the clamping the burst signal in IC5. VR4 is a control to set the SC lock range.

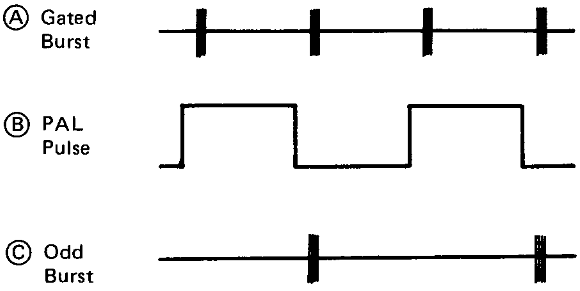

Fig. 9-9-1 Odd Burst Signal

9-10 +9V DC Regulator Circuit

Outline

This circuit generates the +9V DC power by regulating the +12V DC supplied from the battery pack, AC adaptor or the camera control unit (RCU). The +9V is sent to all circuits in the camera as a power source.

Details

The DC voltage at pin 4 of DC regulator IC9 is compared with the reference voltage generated in IC9. The difference level controls the DC voltage at pin 11 of IC9. The DC voltage at pin 11 of IC9 is then fed through Q19 and pin 6 of CN8 to the base of power transistor to control the current flowing between the emitter and base of power transistor. In this way, the voltage at the collector of power transistor is kept +9V DC even if the +12V sent to the emitter of power transistor varies. VR6 (+9V ADJ) is a control for adjusting the +9V.

9-11 Battery Warning Indicator

Outline

This circuit flashes the the battery warning indicator (BATT) LED in the 1.5 inch viewfinder when the +12V DC supplied to the camera from the battery pack reduces below 11.2V.

Details

The DC voltage set by VR5 (BATTERY WARNING) is sent to pin 4 of comparator IC8, where it is compared with the 5.3V reference DC voltage generated by D5 and fed to pin 3 of IC8. If the DC voltage at pin 4 is higher than the +5.3V reference voltage at pin 3, the potential of comparator output at pin 2 becomes high(H) level and the 12-bit counter IC7 is reset. Therefore, no signal comes out from IC7. However, if the +12V DC from the battery pack reduces and the DC voltage at pin 4 is lower than the +5.3V reference voltage at pin 3, the potential at pin 2 of IC8 becomes low(L) level and the IC7 starts counting the vertical scanning start (Vs) pulse supplied to pin 10 of IC7. The approximately 3 Hz pulse is generated at pin 5 (Q4 output) of IC7.

It is sent to the battery warning indicator (BATT) LED in the 1.5 inch viewfinder to flash it in order to indicate to the camera operator that another battery pack is required. VR5 (BATTERY WARNING) is a control to set the warning level.

10 Deflection Board

The Deflection board contains following circuits.

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10-1 DC Regulator Circuit

Outline

This circuit generates +4.5V and +5V DC by regulating +9V DC. These DC voltages are used as sub power source.

Details

The +4.5V obtained by dividing +9V with R8 and R9 is fed to pins 3 and 5 of DC regulator IC1 as a reference voltage. The output voltages at pins 1 and 7 of IC1 are fed back to pins 2 and 6 respectively for stabilizing the +4.5V DC. These +4.5V are used in the alignment circuit in the next.

The +4.5V is also generated by regulating +9V with the DC regulator circuit consisting of half of IC5, R34 and R35. It is used in the horizontal linearity circuit. The +5V obtained by dividing +9V with R36 and R37 is fed to pin 3 of IC5. The output voltage at pin 1 of IC5 is fed back to pin 2 for stabilizing the +5V DC. It is used in the vertical deflection circuit.

10-2 Alignment Circuit

Outline

Ideally the electron beam corresponding to the center of scanning area should reach on the target surface of pick-up tube in perpendicular. However, generally it reaches on the target out of perpendicular due to manufacturing tolerance of aperture position of beam control grid (G2). Therefore, the center of picture does not have best resolution. This circuit sends the constant current to the horizontal and vertical alignment coils in the deflection coil assembly to generate the magnetic field. The electron beam is bent by the magnetic field and it reaches on the target surface in perpendicular. As a result, the resolution at the center of picture becomes best and the picture shows less shading (unevenness of amplitude). This circuit contains the alignment circuit for red(R), green(G) and blue(B) pick-up tubes.

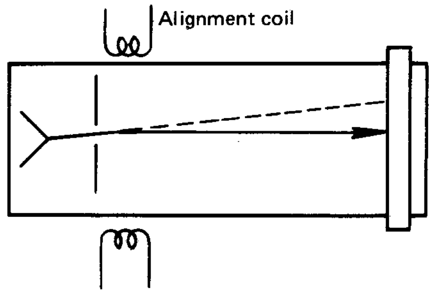


Fig. 10-2-1 Beam Alignment

Details

The DC voltage set by VR1 (R V-ALIGNMENT) is fed to pin 3 of current regulator IC2 and the output at pin 1 of IC2 is fed to the vertical alignment coil for R pick-up tube. The current flowing into the R V-alignment coil is detected by R11 and fed back to pin 2 of IC2. If the current flowing into the R V-alignment coil increases or decreases due to the temperature drift for instance, the variation of the current is detected and fed back to pin 2 of IC2. As a result, the IC2 compensates the output voltage at pin 1 in order to send constant current to the alignment coil.

If the voltage at pin 1 of IC2 is set to +4.5V by adjusting VR1, no current flows to the alignment coil. If it is set to lower the +4.5V, the current flows to the coil from R11 to pin 1 of IC2. However, it is set to higher than +4.5V, the current flows to the coil from pin 1 of IC2 to R11.

+4.5V is added to pin 3 of IC2 through R13 (330 ohms). Therefore, even if VR1 is adjusted, the voltage at pin 3 changes slightly because the voltage set by VR1 is added to pin 3 of IC2 through R20 (6.8Kohms). VR1 adjusts the direction and value of current flowing into the R V-alignment coil.

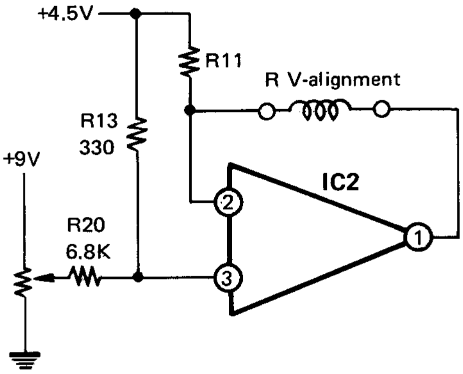


Fig. 10-2-2 Alignment Circuit

Another half of IC2 sends the constant current to R H-alignment coil as in the case of R V-alignment coil and VR2 (R H-ALIGNMENT) is a control for adjusting the value and direction of the current.

IC3 is the constant current regulator which sends the constant current to the H and alignment coil for the green(G) pick-up tube. It operates similarly as in the case of aforementioned R alignment circuit. VR3 (G V-ALIGNMENT) and VR4 (G H-ALIGNMENT) are controls for adjusting the value and direction of current flowing to G V-alignment coil and G H-alignment coil respectively.

IC4 is the constant current regulator which sends the constant current to the alignment coil for the blue(B) pick-up tube. It operates as in the case of aforementioned R alignment circuit. VR5 (B V-ALIGNMENT) and VR6 (B H-ALIGNMENT) are controls for adjusting the value and direction of current flowing to B V-alignment coil and B H-alignment coil respectively.

10-3 Horizontal Deflection Circuit

Outline

This circuit generates the sawtooth current for the horizontal(H) beam deflection inside the pick-up tube and supplies it to the horizontal deflection coil for the green(G), red(R) and blue(B) pick-up tubes.

Details

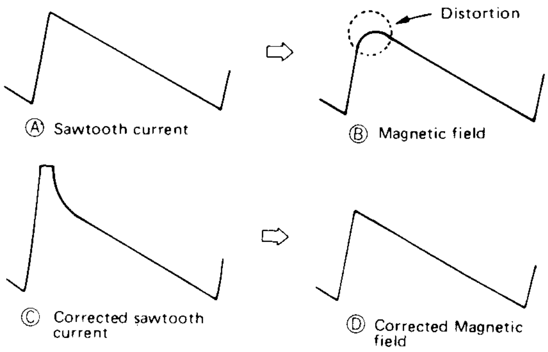
The negative horizontal drive (HD) pulse is fed from pin 4 of CN4 to inverter Q4. The inverted HD pulse obtained at the collector of Q4 is then supplied through switching amplifier Q5 to horizontal deflection output Q6. When Q6 is switched by the HD pulse from Q5, the collector current of Q6 resonated with L1 and C25, and resultant horizontal sawtooth current is fed to the horizontal deflection coil for the G, R and B pick-up tubes through L2 (G H-SIZE), L3 (R H-SIZE) and L4 (B H-SIZE) respectively. The DC voltage set by VR7 (TOTAL H-SIZE) is fed through buffer Q8 to the base of buffer Q7 to control the power supply voltage for Q6. As a result, the value of sawtooth current is changed. When SW2 (H OVERSCAN SWITCH) is set to the OVERSCAN position, the base potential of Q8 increases. Therefore, the H sawtooth current increases for the H overscanning.

10-4 Horizontal Linearity Circuit

Outline

The horizontal(H) deflection circuit is of a switching type, so that the generated sawtooth current waveform has poor linearity. By feeding the sawtooth current to the deflection coil, the intensity of the magnetic field generated in the deflection coil is not linear as the pick-up tube s electron beam is deflected. If a linear sawtooth current Ⓐ is sent to the deflection coil, however, the magnetic field in the scanning start portion is distored Ⓑ due to the effect of the pick-up tube s electrodes, coil hysterisis, etc. As a result, the linearity of the scanning start portion deteriorates.

Therefore, in order to generate a linear magnetic field intensity Ⓓ and to correct the linearity of the scanning start portion, it is necessary to feed a nonlinear sawtooth signal Ⓒ to the deflection coil.



Ⓐ Sawtooth current
Ⓑ Magnetic field
Ⓒ Corrected sawtooth current
Ⓓ Corrected Magnetic field

Fig. 10-4-1 Horizontal Linearity Correction-1

This circuit generates a waveform to correct the overall linearity of horizontal sawtooth current waveform and its starting portion. The horizontal deflection circuit is connected to one end of the horizontal deflection coil, and the horizontal linearity circuit to the other end. The same circuit is used for correcting the horizontal linearity of green(G), red(R) and blue(B) picture.

Details

This circuit contains the horizontal linearity circuit for G, R and B deflection.

- **G Horizontal Linearity Circuit**

The horizontal(H) flyback pulse Ⓔ produced from the collector of Q6 in the horizontal deflection circuit is integrated by L5, R50 and VR8 (G H-LIN2) into a sawtooth signal Ⓕ. This sawtooth signal is again integrated by L5, R51 and C32 into a parabola signal Ⓖ, which is applied through R52 to pin 6 of amplifier IC6 as a G H-linearity correction signal.

The H flyback pulse Ⓔ from Q6 is integrated by R56 and C33 into a linearity correction signal Ⓗ for correcting the linearity of the starting portion of Ⓗ sawtooth current waveform. The signal H is fed to pin 5 of IC6 where the linearity correction signal Ⓖ and Ⓗ are mixed and amplified.

The mixed signal Ⓘ of these correction signals at pin 7 of IC6 is fed through output transistor Q9/Q10 to the G H deflection coil to correct the linearity of the horizontal sawtooth current waveform.

VR8 (G H-LIN2) is a control for adjusting the overall linearity of sawtooth current and VR9 (G H-LIN1) for adjusting the H-linearity of the starting portion.

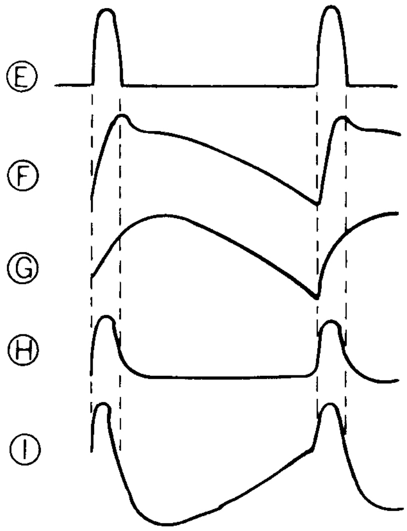


Fig. 10-4-2 Horizontal Linearity Correction-2

- **R Horizontal Linearity Circuit**

This circuit uses the same design as the G horizontal linearity circuit.

The H flyback pulse at the collector of Q6 in the horizontal deflection circuit is integrated by L6, R58 and VR10 (R H-LIN2) into a sawtooth signal. This sawtooth signal is again integrated by L6, R60 and C35 into a parabola signal, which is applied through R59 to pin 6 of IC7 as a R H-linearity correction signal.

The H flyback pulse from Q6 is integrated by R64 and C36 into a linearity correction signal for correcting the linearity of the starting portion of H sawtooth current waveform. This signal is fed to pin 5 of IC7 where the linearity correction signals are mixed and amplified. The mixed signal of these correction signals at pin 7 of IC7 is fed through output transistor Q11/Q12 to the R H deflection coil to correct the linearity of the H sawtooth current waveform.

VR10 (R H-LIN2) is a control for adjusting the overall linearity of sawtooth current and VR11 (R H-LIN1) for adjusting the linearity of the starting portion.

- **B Horizontal Linearity Circuit**

This circuit uses the same design as the G horizontal linearity circuit.

The H flyback pulse at the collector of Q6 in the horizontal deflection circuit is integrated by L7, R67 and VR12 (B H-LIN2) into a sawtooth signal. This sawtooth signal is again integrated by L7, R66 and C37 into a parabola-signal, which is applied through R68 to pin 2 of IC7 as a B H-linearity correction signal.

The H flyback pulse from Q6 is integrated by R72 and C38 into a linearity correction signal for correcting the linearity of the starting portion of H sawtooth current waveform. This signal is fed to pin 3 of IC7 where the linearity correction signals are mixed and amplified. The mixed signal of these correction signals at pin 1 of IC7 is fed through output transistor Q13/Q14 to the B H deflection coil to correct the linearity of the H sawtooth current waveform.

VR12 (B H-LIN2) is a control for adjusting the overall linearity of sawtooth current and VR13 (B H-LIN1) for adjusting the linearity of the starting portion. IC6 (pins 1 - 3) generates the +4.5V by regulating +9V. The +4.5V is used in the horizontal linearity circuit as a reference DC voltage.

10-5 Vertical Sawtooth Generator Circuit

Outline

This circuit generates the vertical sawtooth signal which is used for the vertical deflection.

Details

The vertical scanning start(Vs) pulse is fed through pin 5 of CN4 to base of inverter Q15. The positive V pulse at the collector of Q15 is integrated by R82, C45 and C46 into the V sawtooth signal. The V sawtooth signal is fed through buffer Q16 to the vertical deflection circuit, vertical linearity circuit, skew circuit, horizontal/vertical detection circuit and dark shading circuit. The V sawtooth signal is integrated by R84, VR14 (TOTAL V-LIN) and C46 into the V parabola signal. The V parabola signal is mixed with the V sawtooth signal through C45 to compensate the linearity of V sawtooth signal. VR14 is a control to adjust linearity of vertical deflection by changing the linearity of V sawtooth signal.

10-6 Vertical Deflection Circuit

Outline

This circuit generates the sawtooth current for the vertical (V) beam deflection inside the pick-up tube and supplies it to the V deflection coil for the green(G), red(R) and blue(B) pick-up tubes.

Details

- **G Vertical Deflection Circuit**

The V sawtooth signal generated in the V sawtooth generator circuit is fed through VR19 (TOTAL V-SIZE) to pin 6 of amplifier IC9. The amplified V sawtooth signal obtained at pin 7 of IC9 is fed to the V deflection coil for the G pick-up tube.

The DC voltage set by VR22 (G V-CENTERING) is fed to pin 5 of IC9 to change the horizontal position of deflection.

VR19 (TOTAL V-SIZE) is a control for adjusting vertical deflection size for G, R and B pick-up tubes. When the SW1 (V OVERSCAN SWITCH) is set to the OVERSCAN position, the V sawtooth signal supplied to pin 6 of IC9 is increased and the power supply for IC9 is also increased from the +9V to the +12V. As a result, the V sawtooth current from pin 7 of IC9 is increased for the H overscanning. This switch also increases the V sawtooth current for the R and B pick-up tubes.

- **R Vertical Deflection Circuit**

The V sawtooth signal at the cross point of C59 and R100 is fed to pin 2 of amplifier IC9 through VR20 (R V-SIZE). The amplified V sawtooth signal obtained at pin 1 of IC9 is sent to the V deflection coil for the R pick-up tube.

The V linearity correction signal and the DC voltage for setting the V centering are sent to pin 3 of IC9 through R106 and R109 respectively. VR20 is a control for adjusting the R vertical deflection size.

- **B Vertical Deflection Circuit**

The V sawtooth signal at the cross point of C59 and R100 is fed to pin 2 of amplifier IC10 through VR21 (B V-SIZE). The amplified V sawtooth signal obtained at pin 1 of IC10 is sent to the V deflection coil for the B pick-up tube. The V linearity correction signal and the DC voltage for setting the V centering are fed to pin 3 of IC10 through R113 and R116 respectively. VR21 is a control for adjusting the B vertical deflection size.

10-7 Vertical Linearity Circuit

Outline

This circuit generates the vertical(V) linearity correction signal for the red(R) and blue(B) V deflection signal. The V linearity correction for the green(G) deflection signal is made by adjusting the linearity of V sawtooth signal generated in the vertical sawtooth generator circuit.

Details

The V sawtooth signal obtained at the collector of Q16 in the vertical sawtooth generator circuit is integrated by R90 and C51 and converted into a V parabola signal. The V parabola signal thus made is then fed through inverter Q18 to phase splitter Q19 where the positive and negative V parabola signal is obtained at its collector and emitter. The V parabola signal whose polarity and level are adjusted by VR17 (R V-LIN) is sent to pin 3 of IC9 and mixed with the V deflection sawtooth signal for R pick-up tube as a V linearity correction signal. The V parabola signal whose polarity and level are adjusted by VR18 (B V-LIN) is also applied to pin 3 of IC10 and mixed with the V deflection sawtooth signal for B pick-up tube as a V linearity correction signal. The V parabola signal at the emitter of Q19 is also supplied to the shading signal circuit.

10-8 Skew Circuit

Outline

Even if the horizontal lines in the green(G), red(R) and blue(B) images are matched by rotating the respective deflection coil, the vertical lines may not be matched due to the geometric distortion of deflection coil. This circuit feeds the vertical(V) sawtooth signal to the horizontal(H) deflection coil for correcting the tilt of V line in the R and B images in order to match the R and B images to the G image. Matching images is called registration.

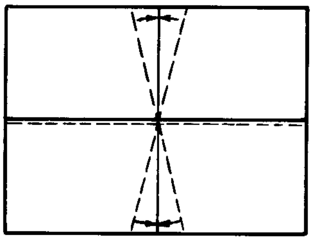


Fig. 10-8-1 Skew

Details

The V sawtooth signal obtained at the emitter of Q16 in the vertical sawtooth generator circuit is fed to phase splitter Q17, where the negative and positive V sawtooth signal is obtained at its emitter and collector. The V sawtooth signal whose phase and level are set by VR15 (B SKEW) is sent through the centering skew output circuit to the H deflection coil for the B pick-up tube as a skew signal. Similarly the V sawtooth signal adjusted by VR16 (R SKEW) is sent through the centering skew output circuit to the H deflection coil for the R pick-up tube.

If no V sawtooth signal is mixed to the H deflection sawtooth signal (current) (Ⓐ), the signal level at the center portion (a), (b) and (c) on the H deflection sawtooth current is almost equal and the electron beams corresponding to point (a), (b) and (c) position as shown in Fig. 10-8-2 Ⓐ.

If the positive V sawtooth signal is added to the H deflection sawtooth signal (Ⓐ′), the signal level at (a′) is lower than (b′) and that at (c′) is higher than (b′). As a result, the electron beams corresponding to point (a′), (b′) and (c′) position as shown in Fig. 10-8-2 Ⓐ′. On the other hand, if the negative V sawtooth signal is mixed (Ⓐ″), the electron beams corresponding to point (a″), (b″) and (c″) position as shown in Ⓐ.

In this way, the vertical line of R and B images is tilted by adjusting the polarity and level of V sawtooth signal mixed with the H sawtooth signal in order to match the R and B images with the reference G image.

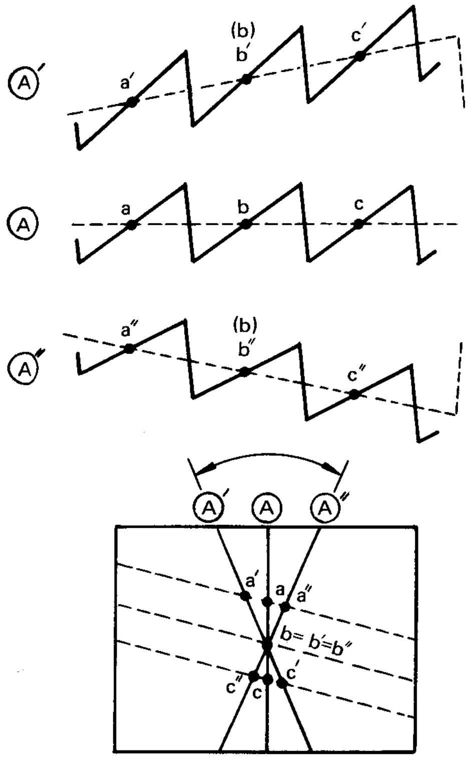


Fig. 10-8-2 Skew Control

10-9 Centering Select Circuit

Outline

The horizontal(H) and vertical(V) centering adjustments of the red(R) and blue(B) images to match them with the green(G) image for the registration are made in the camera or the remote control unit (RCU). This circuit selects whether the centering are controlled in the camera or from the RCU.

Details

The DC voltage which is set by VR39 (B V-CENTERING) is sent to pin 1 of analog switch IC12 and the DC voltage is applied from the RCU through pin 1 of CN5 to pin 2 of IC12. When the RCU is not used and the VTR-RCU Selector Switch on the side of camera is set to the VTR position, the high(H) level is sent through pin 7 of CN4 to the control terminal of IC12 at pin 10 and the DC voltage at pin 1 is selected. The selected DC voltage at pin 15 of IC12 is then fed to the vertical deflection circuit for blue pick-up tube. Therefore, the V centering for the B image is controlled by VR39. When the RCU is used and the VTR-RCU Selector Switch is set to the RCU position, the low(L) level is sent to pin 10 of IC12 and the DC voltage sent from the RCU is selected. The selected DC voltage at pin 15 of IC12 is sent to the vertical deflection circuit for the blue pick-up tube. As a result, the V centering for the B image is controlled by the DC voltage from the RCU. As in the case of V centering control for the B image, the DC voltage set by VR41 (B H-CENTERING) is supplied to pin 3 of IC12 and the DC voltage supplied from the RCU is forwarded to pin 5 of IC12 through pin 2 of CN5. When the RCU is not used, the DC voltage at pin 3 of IC12 is selected and the selected DC voltage at pin 4 of IC12 is then supplied to the H deflection coil for the B pick-up tube through the centering skew output circuit and L4 (B H-SIZE)/R49. When the RCU is used, the voltage fed from the RCU is selected and applied to the H deflection coil via the same route. The DC voltage set by VR40 (R V-CENTERING) or sent through pin 4 of CN5 is selected in analog switch IC12 and the selected DC voltage is applied to the vertical deflection circuit for the R pick-up tube in order to control the V centering of R image. The DC voltage set by VR42 (R H-CENTERING) or sent through pin 3 of CN5 is selected in IC12 and the selected DC voltage is fed to the horizontal deflection circuit for the R pick-up tube to control the H centering of R image.

10-10 Centering/Skew Output Circuit

Outline

This circuit receives the skew signal and H centering DC voltages for the green(G), red(R) and blue(B) images and sends them to the respective H deflection coil.

Details

The DC voltage set by VR23 (G H-CENTERING) is fed through amplifier IC8 (pins 5 - 7) to the H deflection coil for the G pick-up tube.

The DC voltage which controls the H-centering of R image is sent from the centering select circuit to pin 5 of amplifier IC10 and it is mixed with the skew signal sent to pin 6 of IC10 from the skew circuit. The mixed signal at pin 7 of IC10 is then sent to the H deflection coil for the R pick-up tube. The DC voltage which controls the H-centering of B image is sent from the centering select circuit to pin 3 of amplifier IC8 and it is mixed with the skew signal sent to pin 2 of IC8 from the skew circuit. The mixed signal at pin 1 of IC8 is forwarded to the H deflection coil for the B pick-up tube.

10-11 Horizontal and Vertical Detection Circuit

Outline

If no deflection current flows to the deflection coil due to the horizontal (H) and/or vertical(V) deflection circuit failure, the scanning of pick-up tube stops. As a result, the photoconductive layer of the pick-up tube burns out in one spot or one line making the pick-up tube unusable. This circuit detects the absence of the H and/or V deflection current in the event of the deflection current failure and converts it into the DC potential. The DC potential is supplied to the high voltage circuit in the High voltage board to stop generating the high voltages for the pick-up tube. As a result, the electron beam is cut in the pick-up tube and the photoconductive layer of pick-up tube is protected from the burning.

Details

The H flyback pulse obtained at the collector of Q6 in the horizontal deflection circuit is fed to rectifier, consisting of D3 and C4, where the H flyback pulse is converted into the DC voltage. The DC voltage is then applied to switching circuit Q2/Q3. The V sawtooth signal obtained at the emitter of Q16 in the vertical sawtooth generator circuit is sent through buffer Q1 to rectifier consisting of D1, D2, C1 and C2, where it is converted into the DC voltage.

When the H and V deflection circuits work properly, the H flyback pulse and the V sawtooth signal are fed to Q2 and Q1 respectively turning Q2 ON and Q3 OFF Therefore, the high(H) level which is made by rectifying the V sawtooth signal with D1 and D2 is sent to the high voltage circuit through pin 9 of CN4 to generate the high voltages for the pick-up tube.

If the V sawtooth signal is not generated by the failure of V sawtooth generator circuit, the H level is not made. Therefore, low(L) level is sent to the high voltage circuit to stop generating the high voltages. If the H flyback pulse is not sent to rectifier D3 due to the failure of H deflection circuit, Q2 turns OFF turning Q3 ON. As a result, the L level is sent to the high voltage circuit to stop generating the high voltages.

10-12 Shading Signal Circuit

Outline

This circuit generates the dark shading correction signal which equalizes the dark output of the red(R), green(G) and blue(B) pick-up tubes. Refer to 4-2-1 Dark Shading Correction Circuit on page 7.

Details

The positive horizontal(HD) pulse obtained at the collector of Q4 in the horizontal deflection circuit is fed to horizontal(H) sawtooth generator Q20 which generates H sawtooth signal with time constant of R128 and C71. The H sawtooth signal is fed through C70 to the shading signal circuit for the red(R), green(G) and blue(B) signal. The H sawtooth signal at the collector of Q20 is integrated by R129 and C72 into the H parabola signal. The H parabola signal is then fed to the R, G and B shading signal circuit through inverter Q21 and C73.

The vertical(V) sawtooth signal and parabola signals obtained at the collector of Q16 in the vertical sawtooth generator circuit and at the emitter of Q19 in the vertical linearity circuit are respectively sent to the shading signal circuit through analog switch IC11. The positive HD pulse is fed to control terminals (pins 9 and 10)of IC11 and pins 14 and 4 are switched to pins 12 and 5 respectively during HD period. As a result, no V sawtooth and parabola signal are fed to the shading signal circuit during HD period.

- **R Shading Signal Circuit**

The HD pulse, the V sawtooth and parabola signals, and the H sawtooth and parabola signals are routed to the wiper arms of the red dark shading correction controls VR34 (R BL OFFSET), VR35 (R V-SAWTOOTH), VR36 (R V-PARABOLA), VR37 (R H-SAWTOOTH) and VR38 (R H-PARABOLA). These signals are supplied to both the base and emitter of mixer Q26, where they are mixed. The positive or negative red dark shading signal is obtained at the collector of Q26 depending upon the position of these controls and it is sent through buffer Q27 and pin 2 of CN4 to the Process-1 board to correct the R dark shading.

- **G Shading Signal Circuit**

The HD pulse, and the V and H sawtooth and parabola signal are supplied to the wiper arms of the green dark shading correction controls VR29 (G BL OFFSET), VR30 (G V-SAWTOOTH), VR31 (G V-PARABOLA), VR32 (G H-SAWTOOTH) and VR33 (G H-PARABOLA) respectively. These signals are fed to both the base and emitter of mixer Q24, where they are mixed. The positive or negative green dark shading signal is obtained at the collector of Q24 depending upon the position of these controls and it is sent through buffer Q25 and pin 3 of CN4 to the Process-1 board to correct the G dark shading.

- **B Shading Signal Circuit**

The HD pulse, and the V and H sawtooth and parabola signal are supplied to the wiper arms of the blue dark shading correction controls VR24 (B BL OFFSET), VR25 (B V-SAWTOOTH), VR26 (B V-PARABOLA), VR27 (B H-SAWTOOTH) and VR28 (B H-PARABOLA) respectively. These signals are fed to both the base and emitter of mixed Q22, where they are mixed. The positive or negative blue dark shading signal is obtained at the collector of Q22 depending upon the position of these controls and it is sent through buffer Q23 and pin 1 of CN4 to the Process-1 board to correct the B dark shading.

11. High Voltage Board

The high voltage board contains following circuits.

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11-2 -9V DC Regulator Circuit 41
11-3 Feedback Beam Control Circuit 41
11-4 Cathode Blanking Circuit 41

11-1 High Voltage Circuit

Outline

This circuit generates high voltages needed for the red(R), green(G) and blue(B) pick-up tube. This circuit stops generating the high voltages in order to protect the photoconductive layer of pick-up tube when the horizontal(H) and/or vertical(V) deflection circuit fails.

Details

The horizontal drive (HD) pulse is fed through pin 8 of CN16 and inverter Q6 to pin 1 of flip-flop IC1. The pulse whose frequency is divided into a half of HD frequency and duty is 50% - 50% is obtained at pin 2 of IC1 and supplied through driver Q2 and Q3 to converter transformer T1 where the input pulse is boosted.

The boosted pulse at pin 1 of T1 is rectified by D7 and D8, and +300V is generated. +300V is applied to grid-2 (G2) of red(R), green(G) and blue(B) pick-up tubes respectively. The pulse obtained at pin 10 of T1 is rectified by D9 and D10, and +700V is made. Since the anode of D9 is connected to +300V line, the voltage at cathode of D10 becomes +1kV. +1kV is fed to grid-3 (G3) and 6 (G6) of pick-up tubes. +450V generated dividing +1kV with R13 - R16 is sent to grid-5 (G5). The voltages set by VR4 (B FOCUS), VR5 (G FOCUS) and VR6 (R FOCUS) are sent to grid-4 (G4) of pick-up tubes. The step-up pulse at pin 7 of T1 is rectified by D6 generating -100V. The negative DC voltages set by VR1 (R BEAM), VR2 (G BEAM) and VR3 (B BEAM) are fed to grid-1 (G1) together with the feedback beam control signal supplied through C21 - C23. The +100V is made by rectifying the pulse at pin 7 of T1 with D5. The voltage set by VR11 (TARGET) is forwarded to the target of pick-up tubes through pin 5 of CN16. +40V is generated by D3 and it is used in the feedback beam control circuit and the cathode blanking circuit as a power source. It is also sent to AIC board through pin 12 of CN16. -12V generated by D4 is sent to the -9V DC regulator circuit.

11-2 -9V DC Regulator Circuit

Outline

This circuit generates -9V DC by regulating the -12V supplied from the high voltage circuit. The -9V is fed to other circuits as sub power source.

Details

The +12V generated in the high voltage circuit is fed to the emitter of power transistor Q4. Transistor Q5 amplifies the error between the base voltage set by VR10 (-9 ADJ) and the emitter voltage set by 5.1V zener diode D14 and forwards it to the base of Q4. If the collector potential of Q4 changes, the emitter potential of Q4 also changes, and a voltage change appears at its collector. This change controls the base current of Q4 in the direction which opposes the voltage change at the collector of Q4. As a result, the output voltage -9V remains constant. The -9V thus generated is fed to other circuit through pin 10 of CN16.

11-3 Feedback Beam Control Circuit

Outline

When an excessively bright object is shot with the camera, the bright portion is saturated due to the lack of pick-up tube beam and a trailing image is exhibited. This trailing image turns into an unnatural color since the trailing image of each pick-up tube is different. This circuit feeds back the red(R), green(G) and blue(B) signal to the respective pick-up tubes to eliminate the unnatural color by minimizing the trailing image.

Details

The R, G and B signals are fed from the Process-1 board through pins 3, 4 and 2 of CN16 and pins 8, 3 and 2 of IC2 to gamma correction circuit where the white portion of these signals are suppressed. The suppressed R, G and B signal whose level are set by VR7 (R FBC LEVEL), VR8 (G FBC LEVEL) and VR9 (B FBC LEVEL) are respectively fed through amplifiers in IC3 and C21 - C23 and mixed with the DC voltages which control the beam of pick-up tubes. As a result, even if the camera is aimed at the scene which contains the excessively bright object, the beam of each pick-up tube is automatically controlled depending upon the brightness of object and the trailing image of each pick-up tube is minimized.

11-4 Cathode Blanking

Outline

This circuit generates the blanking pulse which is fed to the cathode of red(R), green(G) and blue(B) pick-up tubes to eliminate the retrace lines of scanning.

Details

The horizontal drive (HD) pulse is fed through pin 8 of CN16 and pin 2 of IC4 to cathode blanking mixer in IC4 where it is mixed with the vertical(V) camera blanking(BL) pulse fed to the cathode blanking mixer through pin 5 of IC4 in order to make the composite cathode BL pulse. The composite cathode BL pulse at pin 4 of IC7 is fed to cathode (K) of each pick-up tube to eliminate the retrace line of scanning.

12. Mother Board

The Mother board contains following circuits.

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12- 1 R, G, B Output Circuit 41
12- 2 PIX Out Circuit 41
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12-1 R, G, B Output Circuit

Outline

This circuit receives the red(R), green(G) and blue(B) signal from the Process-2 board and sends them to the remote control unit (RCU) through 32-pin RCU connector.

Details

The R signal obtained at pin 2 of CN3, the G signal obtained at pin 3 of CN3 and the B signal obtained at pin 4 of CN3 are fed to amplifier IC10, IC11 and IC12 respectively. The amplified R, G and B signal at pin 7 of IC10, IC11 and IC12 are sent through buffer Q16, Q17 and Q18 and pins 6, 8 and 10 of CN23 to 32-pin RCU connector.

12-2 PIX Out Circuit

Outline

This circuit selects the signal supplied from the PIX output circuit in the Encoder board or the lineview signal supplied from the special effects generator to the AUX connector on the remote control unit (RCU) and supplies it to the PIX OUT connector on the rear of camera.

Details

The lineview signal which is supplied from the special effects generator to the AUX connector on the RCU is fed through pin 6 of BI1 to buffer Q2. The lineview signal at the emitter of Q2 is forwarded to pin 13 of analog switch IC7 through amplifier Q3 and buffer Q4. The red(R), green(G), blue(B), R-G, B-G or PAL signal which is selected in the Encoder board is applied to pin 12 of IC7 through pin 12 of CN5. When the Monitoring Signal Selection Switch on the side of camera is set to the AUX position, the control terminal of IC7 at pin 11 becomes high(H) level and the lineview signal supplied to pin 13 of IC7 is selected. If the Selection Switch is set to the ENC or REG position, the potential at pin 11 of IC7 becomes low(L) level and the signal supplied to pin 12 of IC7 from the Encoder board is selected. The selected signal is then fed to the PIX connector through buffer Q5 and pin 2 of BI1.

12-3 Viewfinder Video Out Circuit

Outline

This circuit receives the lineview signal supplied to the AUX connector on the remote control unit (RCU) and the signal fed from the PIX output circuit in the Encoder board. These signals are selected and selected signal is fed to the viewfinder for displaying it on the cathode ray tube (CRT) screen. When the portable VTR used with the camera is set in the playback mode, the playback picture from the VTR is displayed on the viewfinder screen preferentially.

Details

The lineview signal obtained at the emitter of buffer Q2 in the PIX out circuit is fed to pin 3 of analog switch IC7. The PAL, red(R), green(G), blue(B), R-G or B-G signal at pin 12 of IC7 is fed through buffer Q6 to pin 5 of IC7. When the Monitoring Signal Selection Switch on the side of camera is set to the AUX position or the Return (RET) Video Button on the power servo zoom lens is depressed, the control terminal of IC7 at pin 9 becomes high(H) level and the lineview signal fed to pin 3 of IC7 is selected. The Selection Switch is set to the ENC or REG position or the Return (RET) Video Button is not depressed, the potential at pin 9 of IC7 becomes low(L) level and the PAL, R, G, B, R-G or B-G signal supplied to pin 5 of IC7 is selected. The selected signal obtained at pin 4 of IC7 is sent through pins 1 and 15, buffer Q7/Q8 and pin 7 of BI3 to the viewfinder.

When the portable VTR used with camera is set in the playback mode, the portable VTR sends the playback signal with the DC voltage to the camera. At this time, the L level is sent from the VTR video circuit to control terminal of IC7 at pin 10. As a result, the playback signal which is sent to pin 2 of IC7 is selected and fed to the viewfinder regardless of position of the Monitoring Signal Selection Switch and the Return (RET) Video Button. The VTR is in the recording mode, the potential at pin 10 of IC7 becomes H level selecting the signal from the previous analog switch IC7 as mentioned before. L1 and C11 make the trap circuit which removes the 4.43MHz subcarrier signal from the video signal.

12-4 VTR Video Circuit

Outline

This circuit sends the video signal to the VTR for recording through 14-pin VTR connector and to the viewfinder when the VTR is in the recording mode. When the portable VTR is set to the playback mode, this circuit receives the playback signal from the portable VTR through 14-pin VTR connector and sends it to the viewfinder.

Details

When the portable VTR is in the recording mode, the potential at pin 5 of comparator IC8 is higher than that at pin 6. Therefore, the control terminal of analog switch IC6 at pin 9 becomes high(H) level connecting pins 3 and 4. As a result, the video signal which is supplied from the Y/chroma mix circuit to pin 3 of IC6 is sent through buffer Q10 and pin 4 of BI1 to the VTR for recording. The video signal is also sent to the viewfinder video out circuit through buffer Q11. However, since the H level at pin 7 of IC8 is sent to the control terminal of IC7 at pin 10 in the viewfinder video out circuit, the video signal sent from this circuit is not selected.

When the portable VTR is set to the playback mode, the VTR sends the playback signal with the DC voltage through pin 4 of BI1. At this time, the potential at pin 5 of IC8 becomes lower than that at pin 6 turning the potential at pin 9 of IC6 to low(L) level and connecting pins 4 and 5 in IC6. Therefore, the video signal supplied from the Y/chroma mix circuit is not selected in IC6 and Q10 turns OFF. The playback signal sent through buffer Q11 to the viewfinder video out circuit is selected in the circuit and sent to the viewfinder since the L level at pin 7 of IC8 is sent to the control terminal of analog switch IC7 at pin 10 of the viewfinder video out circuit.

12-5 Level Indicator Inhibit Circuit

Outline

When the lineview picture or VTR playback picture is displayed on the viewfinder screen by setting the Monitoring Signal Selection Switch on the side of camera to the AUX position or depressing the Return (RET) Video Button on the zoom lens, or setting the portable VTR in the playback mode, this circuit sends the inhibit signal to the viewfinder for removing the level indicator which indicates the level of video output signal provided from the camera.

Details

When the Monitoring Signal Selection Switch is set to the AUX position or the Return (RET) Video Button is depressed, high(H) level from pin 5 of BI5 or pin 8 of BI4 is sent through D3 or D2, and pin 2 of BI3 to the viewfinder for removing the level indicator. When the portable VTR is set in the playback mode, the base potential of switching transistor Q9 becomes low(L) level turning it OFF (Refer to 12-4 VTR Video Circuit on page 35.). As a result, H level at the collector of Q9 is fed via D5 to the viewfinder removing the level indicator. When the L level is fed to the viewfinder, the level indicator appears on the viewfinder screen.

The level indicator inhibit signal obtained at cross point of D2, D3 and D5 is also sent to control terminal (pin 9) of analog switch IC7 in the viewfinder video out circuit for selecting the lineview signal or the signal supplied from the Encoder board.

12-6 Y/Chroma Mix Circuit

Outline

This circuit generates the PAL signal by mixing the luminance(Y), chrominance (chroma) and sync signal. The PAL signal is sent to the VTR for recording. This circuit also sends Y and chroma signal separately to the other type of VTR.

Details

The chroma signal is fed from pin 14 of CN5 to SW2 (Y/CHROMA SWITCH) and the Y signal is sent from pin 16 of CN5 to amplifier/mixer Q19. When the SW2 is set to the Y+CH position, the chroma signal is fed through buffer Q21 to the emitter of amplifier/mixer Q19 where it is mixed with the Y signal fed to the base of Q19 and the sync signal fed through R114/R115 to the emitter of Q19 to make the PAL signal. The PAL signal obtained at the collector of Q19 is fed through buffer Q20 and the VTR video circuit to the VTR for recording. When the SW2 is set to the CH position, the chroma signal is fed through buffer Q22 and pin 7 of CN24 to the VTR. At the same time, the Y signal and sync signal is mixed by Q19, and the mixed signal at the collector of Q19 is also fed to the VTR through Q20 and the VTR video circuit for recording.

12-7 ABC/AWC Control Circuit

Outline

This circuit sends the trigger signal to the AWC/ABC inhibit circuit in the Auto board for the automatic white and black balance setting when the Auto White/Auto Black Set Switch on the front of camera or on the remote control unit (RCU) is depressed to the AWC or ABC position.

Details

When the RCU is not used with the camera and the VTR-RCU Selector Switch on the side of camera is set to the VTR position, potential of control terminal (pins 10, 9 and 11) of analog switch IC1 is set to high(H) level and pins 15 and 1, pins 4 and 3, and pins 14 and 13 of IC1 are connected respectively. When the portable VTR is set to the recording mode and the Color Bar/Camera Selection Switch is set to the CAMERA position, potential at both pins 8 and 9 of NAND gate IC3 become H level setting potential at pin 10 of IC3 to L level. This L level is fed to control terminal (pins 11 and 10) of analog switch IC2 connecting pins 14 and 12, and pins 15 and 2 of IC2 respectively.

In this state, if the Auto White/Auto Black Set Switch SW002 is depressed to the AWC or ABC position, cross point of R6 and C3 is grounded through R1 and potential at pin 3 of IC1 becomes L level momentarily due to discharge of C4. This L level is sent through pins 3 and 4 of IC1, pins 2 and 15 of IC2, and pin 3 of CN6 to the AWC/ABC inhibit circuit.

When the Set Switch SW002 is depressed to the AWC position, H level at pin 1 of IC1 is fed through pins 1 and 15 of IC1, pins 12 and 14 of IC2, and pin 5 of CN6 to the AWC/ABC inhibit circuit. However, if the Set Switch SW002 is depressed to the AWC position, cross point of R2 and C1 is grounded through R1 and potential at pin 1 of IC1 becomes L level momentarily due to discharge of C2. This L level is sent through IC1 and IC2 to the AWC/ABC inhibit circuit.

When the Auto/Manual Selection Switch SW001 is set to the AUTO position, H level at pin 13 of IC1 is sent through pins 13 and 14 of IC1 to inverter IC3 (pins 1-3). The inverted L level at pin 3 of IC3 is then fed through pin 4 of CN6 to the AWC/ABC inhibit circuit. When the Selection Switch SW001 is set to the MANUAL position, pin 13 of IC1 is grounded through R1. The L level is inverted by inverter IC3 and the inverted H level is sent to the AWC/ABC inhibit circuit. The potential at pin 3 of IC3 is also used in the pedestal and gain control circuit.

When the RCU is used with the camera and the VTR-RCU Selector Switch is set to the RCU position, L level is applied to control terminal (pins 10, 9 and 11) of analog switch IC1 connecting pins 15 and 2, pins 4 and 5, and pins 14 and 12 of IC1. Therefore, potential set by the Auto White/Auto Black Set Switch and Auto/Manual Selection Switch on the RCU and fed to pins 2, 5 and 12 is sent to the AWC/ABC inhibit circuit. In this way, the automatic white and black balance is set from the RCU.

When the portable VTR is set to the playback mode or/and the Color Bar/Camera Selection Switch is set to the BAR position, potential at pins 8 and 9 of NAND gate IC3 becomes L level setting potential at pin 10 of IC3 to H level. Therefore, pins 14 and 13, and pins 15 and 1 of IC2 are connected and no trigger signal is sent to the AWC/ABC inhibit circuit.

12-8 Pedestal Control Circuit

Outline

This circuit sends the DC voltage to the Process-1 board for controlling the pedestal level of red(R), green(G) and blue(B) signal.

Details

The potential, which is set by position of Auto/Manual Selection Switch SW001, at pin 3 of NAND gate IC3 in the ABC/AWC control circuit is fed to pin 12 of NAND gate IC3 and control terminal (pin 9) of analog switch IC5 respectively. When the Auto/Manual Selection Switch is set to the AUTO position, the potential at pin 3 of IC3 is low(L) level. When it is set to the MANUAL position, the potential at pin 3 of IC3 is high(H) level. The potential which is set by position of VTR-RCU Selector Switch is fed through pin 4 of CN21 to pin 13 of NAND gate IC3. When the Selector Switch is set to the VTR position, the potential becomes H level. When it is set to the RCU position, the potential becomes L level. The output (pin 11) of IC3 is fed to control terminal (pin 10) of IC5.

As a result, the potential of the control terminals pins 9 and 10 of analog switch IC5 becomes as shown in the Table below depending upon the position of Auto/Manual Selection Switch and VTR-RCU Selector Switch and the output of IC5 is selected.

Auto/Manual Selection Switch	VTR-RCU Selector Switch	Potential at Control Terminal		Output of IC5	
		Pin 9	Pin 10	Pin 3	Pin 13
AUTO	VTR	L	H	Pin 5	Pin 14
	RCU				
MANUAL	VTR	H	L	Pin 2	Pin 15
	RCU	H	H	Pin 4	Pin 11

When the Auto/Manual Selection Switch is set to the AUTO position, the DC level sent from the Auto board through pin 18 of CN6 to pin 5 of IC3 is selected regardless of position of the VTR-RCU Selector Switch. The selected DC voltage at pin 3 of IC3 is fed through DC amplifier IC9 and pin 12 of CN2 to the Process-1 board to automatically control the pedestal level of red(R) signal. When the VTR-RCU Selector Switch is set to the VTR position in the MANUAL mode of the Auto/Manual Selection Switch, the DC voltage set by VR3 (R PEDESTAL) and VR8 (R PEDESTAL PRESET) is sent to the Process-1 board to control the R pedestal level manually. When Selector Switch is set to the RCU position in the manual mode, the DC voltage sent from the remote control unit (RCU) to pin 4 of IC5 is fed to the Process-1 board. Therefore the R pedestal level is manually controlled from the RCU.

As in the case of the R pedestal control circuit, the DC voltage sent from pin 19 of CN6, set by VR4 (B PEDESTAL) and VR9 (B PEDESTAL PRESET) or sent from the RCU for the blue(B) pedestal setting is selected in analog switch IC5 by the position of the Auto/Manual Selection Switch and VTR-RCU Selector Switch. The selected DC voltage at pin 13 of IC5 is fed through DC amplifier IC9 and pin 13 of CN2 to Process-1 board for controlling the B pedestal.

When the VTR-RCU Selector Switch is set to the VTR position, the DC voltage set by VR5 (TOTAL PEDESTAL) and VR10 (TOTAL PEDESTAL PRESET) is sent through DC amplifier IC8 and pin 11 of CN2 to the Process-1 board to control the green(G) pedestal regardless of position of the Auto/Manual Selection Switch. At the same time, the DC voltage is sent through R87 and R91 to the Process-1 board to control the R and B pedestal. Therefore VR5 and VR10 are controls to set the pedestal level of luminance signal.

12-9 Gain Control Circuit

Outline

This circuit sends the DC voltage to the Process-1 board for controlling the amplitude of red(R) and blue(B) signal.

Details

As explained in the 12-8 Pedestal Control Circuit on page 35, potential which is controlled by position of the Auto/Manual Selection Switch on the front of camera and the VTR-RCU Selector Switch is sent to pins 12 and 13 of NAND gate IC3 respectively. The output(pin 11) of IC3 is fed to control terminal (pin 10) of analog switch IC4. The potential at pin 12 of IC3 is also fed to another control terminal (pin 9) of IC4.

As a result, the potential of the control terminals pins 9 and 10 of analog switch IC4 becomes as shown in the Table below depending upon the position of Auto/Manual Selection Switch and the VTR-RCU Selector Switch and the output of IC4 is selected.

Auto/Manual Selection Switch	VTR-RCU Selector Switch	Potential at Control Terminal		Output of IC4	
		Pin 9	Pin 10	Pin 3	Pin 13
AUTO	VTR	L	H	Pin 5	Pin 14
	RCU				
MANUAL	VTR	H	L	Pin 2	Pin 15
	RCU	H	H	Pin 4	Pin 11

When the Auto/Manual Selection Switch is set to the AUTO position, the DC level sent from the Auto board to pin 5 of IC4 is selected regardless of position of the VTR-RCU Selector Switch. The selected DC voltage at pin 3 of IC4 is fed through pin 21 of CN2 to the Process-1 board to automatically control the R signal level.
When the VTR-RCU Selector Switch is set to the VTR position in the MANUAL mode of Auto/Manual Selection Switch, the DC voltage set by VR1 (R GAIN) and VR6 (R GAIN PRESET) is fed to the Process-1 board for controlling the R signal manually. When the Selector Switch is set to the RCU position in the manual mode, the DC voltage sent from the remote control unit (RCU) to pin 4 of IC4 is selected and fed to the Process-1 board. Therefore, the R signal level is manually controlled from the RCU.
As in the case of the R gain control circuit, the DC voltage sent from pin 17 of CN6, set by VR2 (B GAIN) and VR7 (B GAIN PRESET) or sent from the RCU for the B signal level setting is selected in analog switch IC4 by the position of the Auto/Manual Selection Switch and the VTR-RCU Selector Switch. The selected DC voltage at pin 13 of IC4 is forwarded through pin 18 of CN2 to the process-1 board for setting the B signal level.

12-10 Intercom Circuit

Outline

This circuit receives the audio signal from the special effects generator through the remote control unit (RCU) for the oral communication between the camera operator and director when the camera is used in the system. This circuit also contains the detail control selection and the color bar/camera control selection circuit.

Details

The audio signal for the oral communication between the camera operator and director is fed from the RCU through pin 2 of CN24 together with the color bar/-camera control DC level. The audio signal is fed through pin 10 of CN21 and the intercom level control to the intercom jack. The audio signal is returned from the intercom jack through pin 9 of CN21, buffer Q12 and pin 1 of CN24 to the RCU.
The color bar/camera control DC level from the RCU is fed to pin 5 of analog switch IC2. (The audio signal is removed by the integrator consisting of R62 and C18.)
The color bar/camera control DC level set by the Color Bar/Camera Selection Switch is fed through pin 5 of CN15 to pin 3 of IC2. When the VTR-RCU Selector Switch is set to the VTR position the DC level at pin 3 of IC2 is selected and the selection of color bar or camera is made by the Color Bar/Camera Selection Switch on the side of camera. When the Selector Switch is set to the RCU position, the DC level from the RCU is selected and selection of color bar or camera is made by the Color Bar/Camera Selection Switch on the RCU.
The detail control DC level is sent from pin 6 of BI5 to pin 13 of analog switch IC6, and from pin 1 of CN24 to pin 12 of IC6 respectively. When the VTR-RCU Selector Switch is set to the VTR position, control terminal (pin 11) of IC6 becomes high(H) level and the DC level at pin 13 of IC6 is selected. The selected DC level is sent through inverter IC3 to the Process-2 board. In this way, the addition of detail signal to the video signal is controlled by the Detail ON/OFF Switch on the side of camera. When the VTR-RCU Selector Switch is set to the RCU position, potential at pin 11 of IC6 becomes low(L) level and the DC level at pin 12 of IC6 is selected. Therefore, the detail signal is controlled by the Detail ON/OFF Switch on the RCU.

12-11 VTR Trigger Circuit

Outline

This circuit sends the trigger DC level to the portable VTR for recording. This circuit also lights the recording indicator in the viewfinder to indicate the recording mode of VTR to the camera operator.

Details

When the VTR Start/Stop Button on the zoom lens is not depressed, the high(H) level is fed from the lens to the base of inverter Q15 and Q14 through pin 9 of BI4 turning them ON. Therefore, low(L) level at the collector of Q15 is fed through pin 7 of BI1 to the portable VTR and the VTR is in pause mode. The L level at the collector of Q14 is fed through SW1 (VTR COMPATIBILITY SWITCH) and pin 9 of BI3 to the viewfinder to turn OFF the recording indicator.
When the VTR Start/Stop Button is depressed, the L level is fed to inverter Q15 and Q14 turning them OFF. As a result, the H level at the collector of Q15 is fed to the portable VTR to start recording and the H level at the collector of Q14 is fed to the viewfinder to light the

recording indicator. When the VTR Start/Stop Switch is depressed again, the VTR becomes pause mode and the recording indicator goes OFF.

SW1 (VTR COMPATIBILITY SWITCH) is used for the VTR which starts recording with L level and pauses with H level.

When the camera is used with the remote control unit (RCU) and the VTR-RCU Selector Switch is set to the RCU position, potential at the cathode of D12 becomes L level. Therefore, the recording indicator does not light ON and OFF with the operation of VTR Start/Stop Button. In this case, recording indicator lights ON and OFF with the potential fed from the RCU through pin 1 of B12 as a tally light.

12-12 Other Circuits

Q13 lights the power indicator in green when the Standby/Operate Selection Switch is set to the STANDBY position. When the Selection Switch is set to the OPERATE position, potential at the base of Q13 is low(L) level turning it OFF. When the Selection Switch is set to the STANDBY position, the base potential of Q13 becomes high(H) level turning it ON. Therefore, the +9V is fed through R75 and pin 7 of CN21 to the power indicator to light it in green.

Q24 closes the lens iris when the Color Bar/Camera Selection Switch is set to the BAR position. When the Selection Switch is set to the CAMERA position, potential at the base of Q24 becomes H level turning it OFF. Therefore, the lens iris is closed by DC voltage comes from the Auto board through pin 14 of CN6 and D13. However, when the Selection Switch is set to the BAR position, the base potential of Q24 becomes L level turning it ON. As a result, the +9V is fed to the lens through pin 5 of B14 to close the lens iris regardless of the DC voltage comes from the Auto board.

13. AIC Board

Outline

This circuit controls the iris of zoom lens when the camera is used with the remote control unit (RCU).

Details

- **When the Iris Control Selection Switch on the zoom lens is set to the AUTO position ;**

In the normal operating condition, the low(L) level is sent through pin 5 of CN1 to control terminals (pins 10 and 11) of analog switch IC1 connecting pins 2 and 15, and pins 12 and 14 respectively. Therefore, highest signal (NAM signal) among red(R), green(G) and blue(B) signal is fed from pin 15 of IC1 to the lens through pin 6 of CN2 and the iris is automatically controlled in the lens in reference with the NAM signal.

When the Auto White/Auto Black Set Switch is set to the ABC position or the Color Bar/Camera Selection Switch is set to the BAR position, high(H) level is fed to control terminals (pins 10 and 11) of IC1 connecting pins 1 and 15, and pins 13 and 14 of IC1. As a result, L level at pin 14 of IC1 is sent to the zoom lens through pin 5 of CN2 to close the lens iris.

- **When the remote control unit (RCU) is used and the Iris Control Selection Switch on the zoom lens is set to the REM (remote) position ;**

When the Lens Iris Control on the RCU is set to the AUTO position, low(L) level is sent from the RCU through pin 10 of CN1 to the base of Q1 turning it OFF. As a result, potential at the control terminal (pin 9) of analog switch IC1 becomes high(H) level and pins 3 and 4 of IC1 is connected. In the normal operating condition, L level at pin 5 of CN1 is fed to control terminals (pins 10 and 11) of IC1. Therefore, pins 2 and 15, and pins 12 and 14 are connected in IC1.

The NAM signal obtained at pin 3 of CN1 is fed through pins 2 and 15 of IC1 to negative input (pin 2) of amplifier IC2. The amplified signal at pin 1 of IC2 is sent to pin 5 of another amplifier IC3. The amplified signal at pin 7 of IC3 is rectified by D6 and C2 into the DC voltage. The DC voltage corresponding to the NAM signal is sent through pins 3 and 1 of amplifier IC3, pins 3 and 4, and pins 12 and 14 of IC1 to the zoom lens as a DC voltage which controls the lens iris automatically corresponding to the incoming light intensity.

When the incoming light intensity increases, the NAM signal level also goes up. At this time, the DC voltage at pin 1 of IC3 is decreased. The decreased DC voltage is fed to the zoom lens to reduce the iris opening. When the incoming light intensity decreases, the reverse operation takes place.

In this way, the iris of zoom lens is controlled automatically corresponding to the incoming light intensity and the video signal level from the camera is maintained in constant regardless of incoming light intensity. VR1 (IRIS SET) is a control to set the automatic iris level.

Another half of IC2 (pins 5 - 7) is +5V DC regulator for generating reference +5V.
When the Lens Iris Control on the RCU is set to the MANUAL position, H level is fed from the RCU to the base of Q1 to turn it ON. Therefore, potential at pin 9 of IC1 becomes L level and pins 5 and 4 of IC1 are connected. As a result, DC voltage which is set by the Lens Iris Control on the RCU is sent to the zoom lens through pins 5 and 4 to control lens iris manually. When the Auto White/Auto Black Set Switch is set to the ABC position, or the Color Bar/Camera Selection Switch is set to the BAR position, H level is fed to control terminals (pins 10 and 11) of IC1 connecting pins 1 and 15, and pins 13 and 14 of IC1. As a result, L level at pin 14 of IC1 is sent to the zoom lens to close the lens iris.

14. Mic Board

Outline

This circuit amplifies audio signal picked up by the microphone and supplied to the Line input on the side of camera. The amplified audio signal is fed to the VTR for recording.
This circuit also amplifies the audio signal for the audio monitoring.

Details

The -70dB audio signal picked up by the microphone connected to the MIC 1 and 2 connectors CN011 and CN009 is fed to pin 1 of CN1 where it is mixed with the audio signal fed from the Line connector CN018. The mixed audio signal is fed through SW1 (INPUT SELECTOR) to amplifier IC1 and IC2 and amplified +50dB. The -20dB audio signal obtained at pin 7 of IC2 is then supplied through SW1 and pin 1 of CN3 to the VTR for recording.
The audio signal can be monitored through the earphone.
When the SW1 is set to the -70dB position, the audio signal from the microphone and the Line connector is directly sent to the VTR without the amplification. The audio signal at pin 7 of IC2 is sent through SW2 (MONITORING SELECTOR) to pin 3 of amplifier when SW2 is set to the MIC position. The amplified audio signal at pin 1 of IC2 is sent to the Audio Monitoring Jack through pin 1 of CN4. The SW2 is set to the playback position, the playback audio is fed to pin 3 of amplifier IC2 through pin 4 of CN3 and SW2 from the specific VTR and the playback audio monitoring is possible.

15. 1.5" Viewfinder WV-VF30

The 1.5" viewfinder WV-VF30 contains following circuits.

Page

15-1 +1.8V/+4.8V Power Supply Circuit 47
15-2 +6V Power Supply Circuit 47
15-3 Video Amplifier Circuit 47
15-4 Horizontal Deflection Circuit 48
15-5 High Voltage Circuit 48
15-6 Vertical Deflection Circuit 48
15-7 Level Indicator Drive Circuit 48
15-8 Indicator Drive Circuit 49

15-1 +1.8V/+4.8V Power Supply Circuit

Outline

This circuit generates +1.8V and +4.8V and sends them to horizontal and vertical deflection circuit as reference voltage and power supply.

Details

+1.8V obtained by dividing +9V with R7, R8 and VR3 (+1.8V ADJ) is fed through buffers Q1 and Q2 to pin 9 of IC1 as a reference voltage.
+4.8V obtained by dividing +9V with R11 and R12 is routed through buffers Q3 and Q4 to pins 2 and 12 of IC1 as a power source. +4.8V is fed to R6 as a source.

15-2 +6V Power Supply Circuit

Outline

This circuit generates +6V and sends it to the heater of cathode ray tube (CRT) and the video amplifier circuit.

Details

Since +5.9V which is generated by 5.9V zener diode D10 is fed to the base of buffer Q11, potential at its emitter becomes approximately +6.5V. Therefore, the heater current of CRT flows from +9V at pin 4 of CN2 to +6.5V at the emitter of Q11.
The +6.5V obtained at the emitter of Q11 is also fed to the video amplifier circuit board.

15-3 Video Amplifier Circuit

Outline

This circuit receives the video signal from the viewfinder video out circuit in the Mother board. The video signal is amplified and sent to the grid-1 (G1) of cathode ray tube (CRT).

Details

The video signal is sent from pin 7 of CN1 to the video amplifier in IC1 through pin 18 of IC1. The amplified signal is fed to the video mix circuit where it is mixed with the vertical blanking (V BL) pulse from the V oscillator circuit and the level indicator signal from the indicator generator circuit. The mixed signal whose level is set by VR4 (CONTRAST) is fed through amplifier Q5, C15 and pin 3 of CN2 to grid-1 (G1) of CRT.

The DC voltage set by VR5 (BRIGHTNESS) is mixed with the video signal through R20 and sent to G1. When SW1 (PEAKING ON/OFF SWITCH) is set to the ON position, the frequency response at 2.5MHz portion of video signal is increased for making focus of picture in the viewfinder easily.

15-4 Horizontal Deflection Circuit

Outline

This circuit generates horizontal deflection sawtooth current for horizontal scanning of beam inside the cathode ray tube (CRT).

Details

The video signal is fed to the sync separator in IC1, where the sync signal of video signal is separated. The separated sync is fed to the phase comparator where the phase of horizontal(H) sync signal is compared with the H sawtooth signal which is generated from the H flyback pulse at pin 20 of IC1 with integrator consisting of R3, R4, C8 and C9 and sent through pin 19 of IC1. The phase difference between two signals is converted into the DC potential and it is sent to the H oscillator to control the oscillating frequency. As a result, the H oscillator oscillates the signal whose frequency and phase match to those of H sync signal. VR2 (H HOLD) is a control for setting the oscillation frequency in a steady state.

The H pulse is then fed to H deflection output Q6 through the H deflection drive circuit. The H sawtooth current obtained at the collector of Q6 is supplied through C24, R24/L3, L4 (H SIZE) and pin 2 of CN3 to the H deflection coil. The H flyback pulse obtained at the collector of Q6 is sent to the high voltage circuit. The H pulse obtained at the H oscillator in IC1 is sent to the indicator generator circuit.

15-5 High Voltage Circuit

Outline

This circuit generates high voltages for cathode ray tube (CRT) electrodes.

Details

The flyback pulse generated in the horizontal(H) deflection circuit is supplied to primary winding of the flyback transformer (FBT) in the high voltage pack T1 to step up the flyback pulse to necessary level.

The boosted pulse obtained at the secondary winding of FBT are rectified to generate high voltages.

+5kV obtained by rectifying the boosted pulse is fed to the CRT anode. +650V obtained at pin 5 of T1 is divided by VR6 (FOCUS) and R25 - R27. The DC voltage set by VR6 is fed to grid-3 of CRT. Approximately +120V obtained at cross point of R26 and R27 is fed to grid-2 of CRT. -55V obtained at pin 8 of T1 is sent to Q5 as a power source. The voltage set by VR5 (BRIGHTNESS) is fed to grid-1 together with video signal supplied from the video amplifier circuit. The heater voltage for CRT is fed from the +6V power supply circuit.

15-6 Vertical Deflection Circuit

Outline

This circuit generates vertical(V) deflection sawtooth current for vertical scanning of beam inside the cathode ray tube (CRT).

Details

The video signal is fed through pin 18 of sync separator in IC1 where only the sync signal is separated. The separated sync signal is then sent to the vertical(V) sync separator in IC1 and the V sync signal is detected. The V sync signal is fed to the V oscillator to trigger it and the V oscillator oscillates the V sawtooth signal. The V sawtooth signal is then fed through V deflection drive circuit and pin 3 of IC1 to the V deflection coil. +1.8V DC is fed to V deflection drive circuit through the V reference generator in IC1 as a reference voltage. VR1 (V SIZE) is a control for adjusting V scanning size.

15-7 Level Indicator Drive Circuit

Outline

This circuit generates level indicator bar displayed on the viewfinder screen and varies the vertical position of the indicator bar corresponding to the intensity of incoming light.

Details

The video signal is fed to pin 3 of amplifier IC2. The sync level of the amplified video signal Ⓐ obtained at pin 1 of IC2 is clamped by clamping diode D4. The clamped signal Ⓐ is fed to low level clip circuit consisting of Q7/Q8 where the low level of clamped signal is clipped (Ⓑ). The clip level is adjusted by VR7 (CENTER ADJ) and the signal level after the clip determines the vertical position of indicator bar on the viewfinder screen. The clipped signal is again clamped by D6. The clamp potential set by VR8 (LOWER LIMIT) determines the lowest position of indicator bar. The clamped signal Ⓒ is then sent buffer Q10 to rectifier, consisting of D9 and C29, where it is converted into the DC voltage corresponding to the signal level. The DC voltage thus made is fed to indicator generator circuit in IC1.

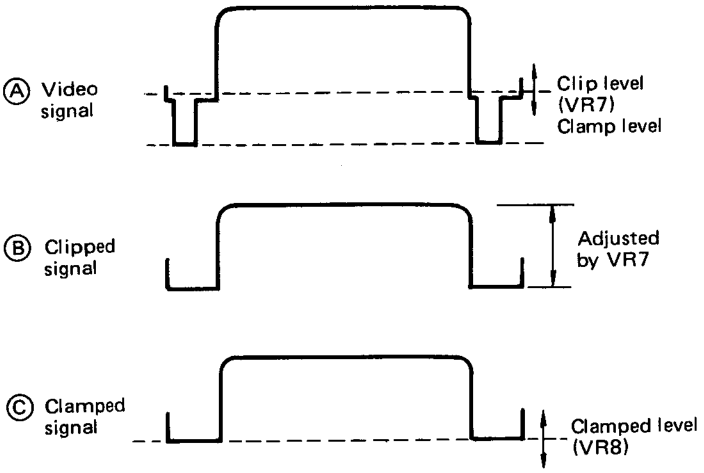

Fig. 15-7-1 Video Signal Detection

In the indicator generator circuit, the level indicator signal is generated by the vertical(V) sawtooth signal supplied from the V oscillator circuit and the horizontal(H) pulse fed from the H oscillator circuit and its phase is controlled by the DC voltage sent through pin 15 of IC1.

The level indicator signal is mixed with the video signal and sent to grid-1 (G1) of cathode ray tube (CRT).

15-8 Indicator Drive Circuit

Outline

This circuit lights ON or OFF the color conversion warning (CCW) indicator, the battery warning/high gain indicator and the recording/tally indicator in front of cathode ray tube (CRT) screen by the control signals supplied to this circuit.

Details

When the automatic white and black balance is being set, the pulse whose frequency is approximately 3Hz is fed to switching transistor Q12 to turn it ON and OFF. Therefore the CCW indicator D101 flashes. If the automatic white and black balance is set improperly, the 50Hz vertical scanning start(Vs) pulse is fed to Q12 and D101 lights ON.

When the High Gain Selection Switch on the side of camera is set to the +6dB or +12dB position, the high level is sent to Q13 turning it ON and the battery warning/high gain indicator D103 lights. When the DC voltage from the battery pack decreases below the specified level, the pulse whose frequency is approximately 3Hz is supplied to Q13 turning it ON and OFF. Therefore, D103 flashes regardless of position of the High Gain Selection Switch.

When the VTR Start/Stop Button on the zoom lens is depressed for the recording or the camera is selected in the system using the special effects generator, high level is sent to Q14 to turn it ON and the recording/tally indicator D102 in the viewfinder and the tally light D100 on the front of viewfinder light. If the Tally ON/OFF Switch SW2 is set to the OFF position, D100 turns OFF.

16. 5" Viewfinder WV-VF35

The 5" viewfinder circuit contains following circuits.

Page
16-1 Video Amplifier Circuit 49
16-2 Sync Separation Circuit 50
16-3 Vertical Sawtooth Circuit 50
16-4 Vertical Deflection Circuit 50
16-5 Horizontal Deflection Circuit 51
16-6 High Voltage Circuit 51
16-7 Level Indicator Drive Circuit 51
16-8 Level Indicator Circuit 52
16-9 Tally Drive Circuit 52

16-1 Video Amplifier Circuit

Outline

This circuit amplifies the video signal supplied from the camera head through pin 1 of CN2. The amplified video signal is supplied to the cathode ray tube (CRT).

Details

The video signal at pin 1 of CN2 is fed to amplifier Q2 and Q3 through buffer Q1 and VR1 (CONTRAST). The amplified video signal at the collector of Q3 is sent through buffer Q4, D2 and D1 to the emitter of amplifier Q6. The level indicator signal which is generated in the level indicator circuit for displaying the level indicator bar on the CRT screen is mixed with the video signal through D7. The vertical(V) sawtooth signal is supplied from the V deflection circuit to the base of switching amplifier Q5 to generate the V blanking (BL) pulse. The V BL pulse at the collector of Q5 is mixed with the video signal for eliminating the vertical retrace line on the CRT screen.

The amplified video signal which is mixed with the level indicator signal and the V BL pulse is applied from the collector of Q6 through L2/R23 and pin 3 of CN4 to grid-1 of CRT.

The voltage which is set by VR2 (BRIGHTNESS) and VR3 (BRIGHTNESS PRESET) is fed through buffer Q7, D4 and pin 4 of CN4 to cathode (K) of CRT to set the brightness of CRT screen. The flyback pulse sent from the high voltage circuit through pin 2 of CN3 to D5 is mixed with brightness-controlled DC voltage and supplied to cathode (K) to eliminating the horizontal retrace line on the CRT. When SW1 (PEAKING ON/OFF) is set to the ON position, the frequency response at 2.5MHz portion of video signal is boosted for making focus of picture on the viewfinder easily.

16-2 Sync Separation Circuit

Outline

This circuit separates the sync signal from the video signal supplied from the camera and sends it to other circuit.

Details

The video signal obtained at the emitter of buffer Q1 in the video amplifier circuit is applied to sync separator Q8 which detects only the sync signal. The sync signal at the collector of Q8 is sent to the horizontal deflection circuit and level indicator circuit. The separated sync is fed through buffer Q9 to integrator consisting of R38 and C20 where the horizontal(H) sync is removed and only the vertical(V) sync remains. The V sync thus made is supplied through inverter Q10 to the vertical sawtooth circuit. The V sync signal at the cross point of R38 and C20 is sent to the vertical deflection circuit through integrators consisting of R39/C21 and R40/C22.

16-3 Vertical Sawtooth Circuit

Outline

This circuit generates the vertical sawtooth signal and sends it to the level indicator drive circuit.

Details

The negative vertical(V) sync signal is fed from the sync separation circuit through pin 1 of BI5 and CN5 to V sawtooth generator Q202. During the positive portion of V sync signal, C207 is charged through R243. During the negative portion of V sync signal, Q202 turns ON and C207 is discharged through Q202. Therefore, the V sawtooth signal is made at the emitter of Q202. The sawtooth signal is then fed to the level indicator drive circuit through amplifier Q203.

16-4 Vertical Deflection Circuit

Outline

This circuit generates vertical(V) deflection sawtooth current for vertical scanning of beam inside the cathode ray tube (CRT).

Details

The positive V sync signal is supplied from the sync separation circuit to V oscillator Q100 as a trigger pulse. Q100 is a free-running V sawtooth generator using positive feedback and works as follows.

When the power switch is turned ON, potential at the collector of Q100 becomes low(L) momentarily due to discharge of C101 and C102, and then gradually increases with the time constant of R107, VR103 (V SIZE), R106, C101, C102 and R104 (Ⓐ). At the same time, the base voltage of Q100 also increases gradually since the collector potential of Q100 is fed back to it base through buffer Q101 and VR100 (V HOLD). Q100 turned ON when its base potential exceeds the specific level. When Q100 is turned ON, C101 and C102 begin to be discharged, and the trigger signal Ⓓ, which is made by filtering the V deflection signal Ⓒ with R112, C104 and C103, is positively fed back to the base of Q100 in order to keep turning ON Q100 until C101 and C102 are fully discharged.

When C101 and C102 are fully discharged, the base voltage of Q100 becomes L level turning it OFF and C101 and C102 begin to be charged again through R107, VR103. As a result, the V sawtooth signal is kept generating.

When the V sync signal is fed to Q100, Q100 generates the V sawtooth signal whose frequency and phase coincide with the V sync signal.

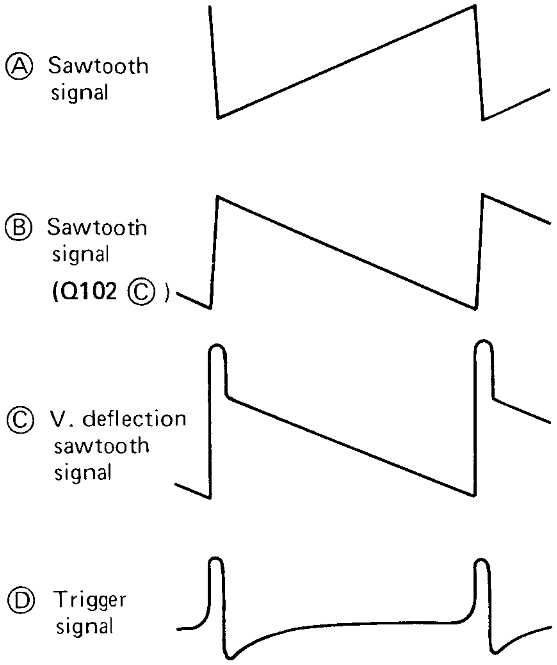

Fig. 16-4-1 Vertical Sawtooth Signal Generation

The V sawtooth signal thus generated is fed through buffer Q101, amplifier Q102, V deflection output Q103/Q104 and pin 3 of CN7 to the V deflection coil. The V sawtooth signal at the emitter of Q101 is integrated by R109, VR102 (V LIN) and C102 into the V parabola signal and it is fed back to V sawtooth generator Q100 for V linearity correction.
VR100 (V HOLD) is a control for setting the oscillating frequency of Q100 in the steady state.

16-5 Horizontal Deflection Circuit

Outline
This circuit generates horizontal deflection sawtooth current for horizontal scanning of beam inside the cathode ray tube (CRT).

Details
The horizontal(H) sync signal is supplied from the sync separation circuit through pin 3 of CN5 and pin 1 of IC202 to the phase comparator where the H sync signal is compared in phase with the H sawtooth signal supplied to pin 3 of IC202. The phase difference between two signal is converted into the DC voltage which is sent to the H oscillator to control oscillating frequency. The oscillated pulse is then fed through the H drive circuit and step-up transformer T201 to H deflection output Q206. The H sawtooth current is sent from the emitter of Q206 through the H deflection coil, L4 and L3 (H SIZE) into its collector.
The H flyback pulse at the emitter of Q206 is integrated by R231 and C214 into the V parabola signal, which is sent to the phase comparator. The H flyback pulse is also sent to the high voltage circuit.

16-6 High Voltage Circuit

Outline
This circuit generates high voltages for cathode ray tube (CRT) electrodes.

Details
The flyback pulse generated in the horizontal(H) deflection circuit is supplied to the primary winding of the flyback transformer (FBT) T200 to step up the flyback pulse to necessary level.
The boosted pulses obtained at the secondary winding of FBT are rectified to generate high voltages.
+9kV generated by rectifying the boosted pulse in T200 and obtained at pin A of T200 is fed to the CRT anode. +390V obtained by rectifying the boosted pulse at pin 5 of T200 with D210 is sent to grid-2(G2). The voltage which is set by VR203 (FOCUS) is applied to grid-3 (G3). +120V obtained by rectifying the boosted pulse at pin 6 of T200 with D211 is fed to the video amplifier circuit as a power source. +85V obtained by rectifying the boosted pulse at pin 7 of T200 with D212 is applied to the circuit which controls the brightness of CRT. The boosted H flyback pulse obtained at pin 6 of T200 is supplied to the video amplifier circuit to make the H BL pulse which eliminates the H retrace line on the CRT screen.

16-7 Level Indicator Drive Circuit

Outline
This circuit generates the pulse which varies the position of the level indicator bar displaying on the viewfinder screen.

Details
The video signal is fed to pin 5 of amplifier IC200. The sync level of amplified video signal Ⓐ obtained at pin 7 of IC200 is clamped by clamping diode D202. The clamp potential is set by VR200 (CENTER ADJ). The clamped signal is rectified by D200 and C206 into the DC voltage (Ⓑ). The DC voltage is sent to low level clip circuit consisting of Q200 and Q201 where the low level of rectified DC voltage is clipped (Ⓒ). The clip level is determined by VR204 (LOWER LIMIT).
The clipped DC voltage is then fed through buffer Q210 to pin 3 of comparator IC200 where the DC voltage Ⓓ is compared with the vertical sawtooth signal Ⓓ fed from the vertical sawtooth circuit and the pulse Ⓔ

whose width is changed by the DC voltage is generated at pin 1 of IC200. The pulse Ⓔ is fed to the level indicator circuit.

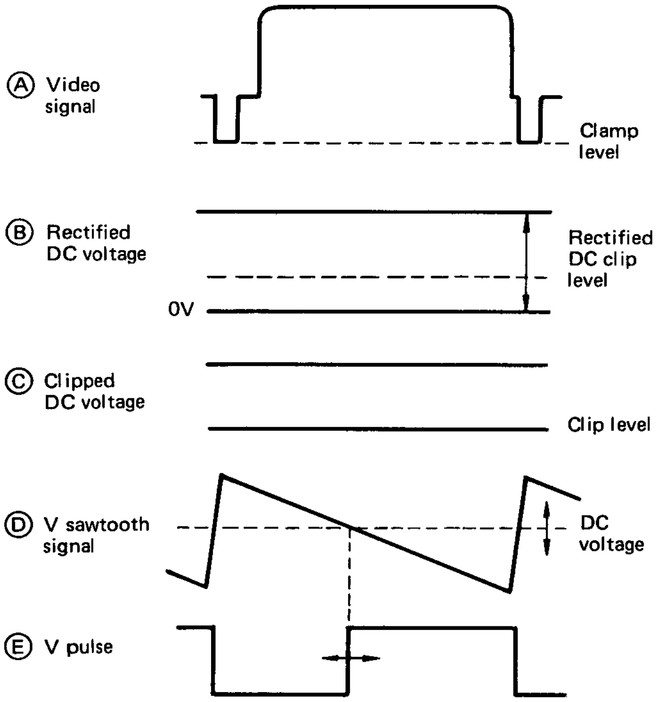
Ⓐ Video signal
Clamp level
Ⓑ Rectified DC voltage
Rectified DC clip level
0V
Ⓒ Clipped DC voltage
Clip level
Ⓓ V sawtooth signal
DC voltage
Ⓔ V pulse

Fig. 16-7-1 Level Indicator Drive Pulse

16-8 Level Indicator Circuit

Outline

This circuit generates the level indicator signal which displays the level indicator bar on the viewfinder screen. The position of the indicator bar is varied by the pulse from the level indicator drive circuit.

Details

The vertical(V) pulse Ⓐ is fed from the level indicator drive circuit to pin 12 of monostable multivibrator IC201 and the V pulse Ⓑ is generated at pin 10 of IC201. The V pulse Ⓑ is fed to the collector of mixer Q205. The horizontal(H) pulse obtained in the sync separation circuit is fed to pin 5 of monostable multivibrator IC201 which generate the H pulse Ⓒ at pin 6 of IC201. The H pulse Ⓒ is fed to the base of Q205. As a result, the level indicator signal Ⓓ whose phase is controlled by the V pulse Ⓐ is generated. The signal Ⓓ at the emitter of Q205 is mixed with the video signal.

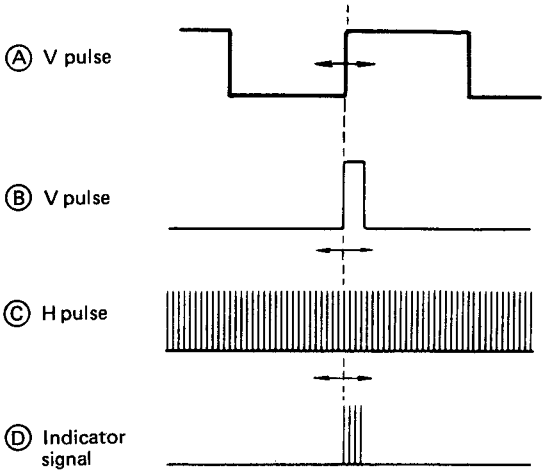
Ⓐ V pulse
Ⓑ V pulse
Ⓒ H pulse
Ⓓ Indicator signal

Fig. 16-8-1 Level Indicator Signal

16-9 Tally Drive Circuit

Outline

This circuit lights ON or OFF the tally lamp with the control signal sent from the camera.

Details

When the camera is selected in the system using the special effects generator, the high(H) level is fed to switching transistor Q207 to turn ON Q207. Therefore, the collector of Q207 is grounded and the tally LED D213 on the rear of viewfinder lights. At the same time, the H level is sent to switching transistor Q208 to turn ON Q208 and Q209. As a result, +9V is fed to tally lamp PL1 on the front of camera to light it ON. When the SW2 (TALLY ON/OFF) is set to the OFF position, the tally lamp PL1 does not light.

17. Remote Control Unit WV-RC30

The remote control unit (RCU) WV-RC30 contains following circuits.

Page
17- 1 +12V DC Regulator Circuit 53
17- 2 Gen-lock Signal Circuit 53
17- 3 PAL Output Circuit 54
17- 4 Sync Separation Circuit 54
17- 5 R, R-G Output Circuit 54
17- 6 B, B-G Output Circuit 55
17- 7 G Output Circuit 56
17- 8 AUX Output Circuit 56
17- 9 PIX Control Circuit 57
17-10 PIX Output Circuit 57
17-11 AWC/ABC Control Circuit 58
17-12 Intercom Circuit 58
17-13 Tally Control Circuit 58
17-14 Gain/Pedestal Control Circuit 58
17-15 Centering Control Circuit 58

17-1 +12V DC Regulator Circuit

Outline

This circuit generates +12V DC from the AC mains. The +12V is fed to all circuit in the remote control unit (RCU) as a power source.

Details

Approximately 16V AC which is obtained at the secondary winding of power transformer is fed to rectifier D20 and +16V DC is made. The +16V DC is fed to the emitter of power transistor Q124. The voltage at the collector of Q124 is fed to pin 2 of +12V DC regulator IC IC6. The voltage at pin 1 of IC6 controls the base potential of Q124. In this way, the voltage at the emit of Q124 is kept constant. The +12V is supplied all circuit in the RCU as a power source.

17-2 Gen-lock Signal Circuit

Outline

This circuit receives the black burst signal supplied to the Gen-lock input connector on the rear of remote control unit (RCU). After phase-shifting the burst on the black burst signal, it is sent to the camera through a camera cable.

Details

The black burst signal Ⓐ supplied to the Gen-lock connector is sent through pin 3 of CN1 and buffer Q1 to sync separator Q2. The separated sync signal Ⓑ obtained at the collector of Q2 is fed through buffer Q3 and VR1 (SYNC BALANCE) to the emitter of buffer Q4 and it is mixed with the black burst signal Ⓐ which comes through Q4. Therefore, the sync signal on the black burst signal is removed and only the burst signal Ⓒ remains. The burst signal at the emitter of Q4 is routed through band pass filter L1/C8, amplifier Q5 and buffer Q6 to the collector of burst gate Q7. VR1 is a control to cancel the sync signal.

The sync signal Ⓑ at the collector of Q2 is fed to 2fH eliminator in IC1, where the equalizing and serration pulses, and the vertical(V) sync component are removed and only the horizontal(H) sync signal remains. The H sync signal is fed to monostable multivibrator and the burst gate pulse Ⓓ is generated at pin 7 of IC1. The burst gate pulse Ⓓ is sent to the base of Q7. VR2 (BURST GATE) is a control to set the phase of the burst gate pulse.

Q7 turns OFF during the negative portion of burst gate pulse Ⓓ and only the burst signal is gated. The gated burst signal Ⓔ is then fed to phase-splitter Q8. The burst signal at the emitter of Q8 is sent to pins 3 and 11 of SW5 (SC PHASE COARSE SWITCH) and the burst signal at the collector of Q8 is fed through buffer Q9 to pins 1 and 9 of SW5. The selected burst signal at pin 6 of SW5 is routed through 90° phase-shifter Q10 and buffer Q11 to pins 10 and 8 respectively. The burst signal whose phase is shifted 90° in step by SW5 is obtained at pin 7 of SW5. The selected burst signal is sent to another 90° phase shifter Q12 which shifts the phase of burst signal 90° continuously with VR46 (SC PHASE FINE). As a result, the phase of burst signal is shifted 360° by use of SW5 and VR46.

The phase-shifted burst signal Ⓔ is then fed through buffer Q13 to the base of buffer Q14, where it is mixed with the sync signal Ⓕ supplied from the collector of Q2 through inverter IC2 (pins 1 - 3) and VR4 (SYNC LEVEL), and the black burst signal Ⓖ is made. The black burst signal Ⓖ whose burst phase is shifted 360° is applied through buffer Q14, VR5 (BLACK BURST LEVEL) and amplifier Q15 to black burst output Q16 - Q18. The black burst signal is then fed to the camera through pin 3 of CN2 and pin 22 of 32-pin connector CN41.

VR3 (SC 90° PHASE) is a control to shift the burst phase 90°.

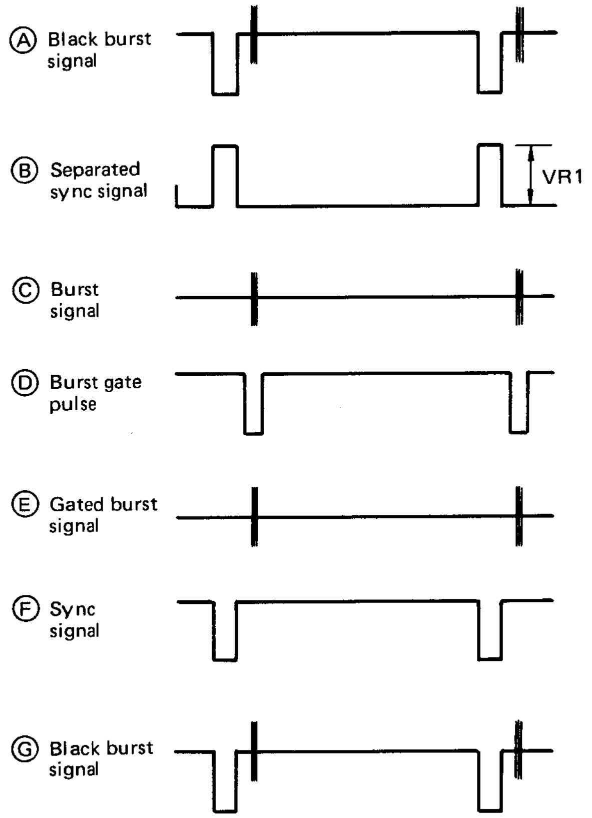

Fig. 17-2-1 Black Burst Signal

17-3 PAL Output Circuit

Outline

The circuit receives the PAL signal from the camera through the camera cable and sends it to the Video output connector on the rear of RCU after correcting the frequency response of PAL signal depending to the length of camera cable.

Details

The PAL signal is fed from the camera through pin 21 of CN41 and pin 3 of CN3 to buffer Q19. The PAL signal obtained at the emitter of Q19 is routed via VR6 (PAL GAIN PRESET) and amplifier Q21 to buffer Q30. The signal at the emitter of Q30 is negatively fed back to the base of amplifier to correct the frequency response. The level and frequency response of feedback signal is selected by SW6 (CABLE LENGTH COMPENSATION) depending upon the camera cable length for the optimum correction. When SW6 is set to the 50m position, base potential of Q25 and Q26 becomes high(H) level turning them ON, and the signal at the emitter of Q30 is fed back through R93/C37, Q26 and R84 to the base of Q21. At the same time, R82 and C31 are connected between the feedback loop and ground through Q25.

When SW6 is set to the 100m, 200m or 300m position, switching transistors operate as shown in the Table below and the level and frequency response of feedback signal are changed.
When SW6 is set to the 200m or 300m position, Q120 or Q20 connected between the emitters of Q19 and Q21 is also turned ON to compensate the frequency response.

Position of SW6	Q22 Q29	Q23 Q28	Q24 Q27	Q25 Q26	Q20	Q120
50m	OFF	OFF	OFF	ON	OFF	OFF
100m	OFF	OFF	ON	OFF	OFF	OFF
200m	OFF	ON	OFF	OFF	OFF	ON
300m	ON	OFF	OFF	OFF	ON	OFF

The frequency-compensated PAL signal obtained at the emitter of Q30 is routed through buffer Q31, VR7 (PAL GAIN) and amplifier Q32 to PAL output Q33 - Q35. The PAL signal at the emitters of Q34/Q35 is sent through pins 1 and 4 to the video output connectors CN38 and CN39.
The PAL signal at the emitter of Q30 is fed to the PIX output circuit through buffer Q119 and to the sync separation circuit.

17-4 Sync Separation Circuit

Outline

This circuit receives the PAL signal and separates the sync signal from the PAL signal. The separated sync signal is supplied to the PIX output circuit.

Details

The PAL signal obtained at the emitter of Q30 in the PAL output circuit is fed through buffer Q36 to sync separator Q37. The positive sync signal separated from the PAL signal and obtained at the collector of Q37 through two inverters IC2 to the PIX output circuit.

17-5 R, R-G Output Circuit

17-5-1 R Output Circuit

Outline

This circuit receives the red(R) signal from the camera through the camera cable and sends it to the R output connector on the rear of RCU after compensating the frequency response of R signal depending on the length of camera cable.

Details

The R signal is fed from the camera through pin 25 of CN41 and pin 3 of CN4 to buffer Q38. The R signal at the emitter of Q38 is supplied through VR8 (R OUTPUT GAIN PRESET) and amplifier Q40 to buffer Q49. The signal at the emitter of Q49 is negatively fed back to the base of Q40 to compensate the frequency response of R signal. The level and frequency response of feedback signal is selected by SW6 (CABLE LENGTH COMPENSATION) depending upon the camera cable length for the optimum compensation. When SW6 is set to the 50m position, base potential of Q44 and Q45 becomes high(H) level to turn them ON and the signal at the emitter of Q49 is fed back through R120/C59, Q45 and R143 to the base of Q40. At the same time, R141 and C53 are connected between the feedback loop and ground through Q44.

When SW6 is set to the 100m, 200m or 300m position, switching transistors operate as shown in the Table below and the level and frequency response of feedback signal are changed. When SW6 is set to the 200m or 300m position, Q121 or Q39 connected between the emitters of Q38 and Q40 is also turned ON to compensate the frequency response.

Position of SW6	Q41 Q48	Q42 Q47	Q43 Q46	Q44 Q45	Q39	Q121
50m	OFF	OFF	OFF	ON	OFF	OFF
100m	OFF	OFF	ON	OFF	OFF	OFF
200m	OFF	ON	OFF	OFF	OFF	ON
300m	ON	OFF	OFF	OFF	ON	OFF

The frequency-compensated R signal obtained at the emitter of Q49 is supplied through buffer Q55, VR11 (R OUTPUT GAIN) and amplifier Q56 to R output Q57 - Q59. The R signal at the emitters of Q58/Q59 is sent through pin 3 of CN11 to the R output connector CN35.

The R signal at the emitter of Q49 is also fed to the PIX output circuit and the R-G output circuit explains in the next.

17-5-2 R-G Output Circuit

Outline

This circuit receives red(R) and green(G) signal to make the R-G signal. The R-G signal is sent to the PIX output circuit.

Details

The R signal is fed from the R output circuit through buffer Q50, VR9 (R-G BALANCE) to the emitter of mixer Q51. The G signal is fed from the G output circuit through buffer Q52 to the base of Q51. The R signal is not inverted and appears at the collector of Q51. The G signal is inverted and appears at the collector. The R-G signal thus obtained at the collector of Q51 is supplied through amplifier Q53/Q54 to the PIX output circuit.

VR9 (R-G BALANCE) is a control to adjust the R signal level to match the G signal and VR10 (R-G GAIN) is a control to adjust the R-G signal level.

17-6 B, B-G Output Circuit

17-6-1 B Output Circuit

Outline

This circuit receives the blue(B) signal from the camera through the camera cable and sends it to the B output connector on the rear of RCU after compensating the frequency response of B signal depending on the length of camera cable.

Details

The B signal is fed from the camera through pin 27 of CN41 and pin 3 of CN5 to buffer Q60. The B signal at the emitter of Q60 is supplied through VR12 (B OUTPUT GAIN PRESET) and amplifier Q62 to buffer Q71. The signal at the emitter of Q71 is negatively fed back to the base of Q62 to compensate the frequency response of B signal. The level and frequency response of feedback signal is selected by SW6 (CABLE LENGTH COMPENSATION) depending upon the camera cable length for the optimum compensation. When SW6 is set to the 50m position, base potential of Q66 and Q67 becomes high(H) level to turn them ON and the signal at the emitter of Q71 is fed back through R219/C82, Q67 and R217 to the base of Q62. At the same time, R208 and C76 are connected between the feedback loop and ground through Q66.

When SW6 is set to the 100m, 200m or 300m position, switching transistors operate as shown in the Table below.and the level and frequency response of feedback signal are changed. When SW6 is set to the 200m or 300m position, Q122 or Q61 connected between the emitters of Q60 and Q62 is also turned ON to compensate the frequency response.

Position of SW6	Q63 Q70	Q64 Q69	Q65 Q68	Q66 Q67	Q61	Q122
50m	OFF	OFF	OFF	ON	OFF	OFF
100m	OFF	OFF	ON	OFF	OFF	OFF
200m	OFF	ON	OFF	OFF	OFF	ON
300m	ON	OFF	OFF	OFF	ON	OFF

The frequency-compensated B signal obtained at the emitter of Q71 is supplied through buffer Q77, VR15 (B OUTPUT GAIN) and amplifier Q78 to B output Q79 - Q81. The B signal at the emitters of Q80/Q81 is sent through pin 3 of CN9 to the B output connector CN37. The B signal at the emitter of Q71 is also fed to the PIX output circuit and the B-G output circuit explains in the next.

17-6-2 B-G Output Circuit

Outline

This circuit receives blue(B) and green(G) signal to make the B-G signal. The B-G signal is sent to the PIX output circuit.

Details

The B signal is fed from the B output circuit through buffer Q72, VR13 (B-G BALANCE) to the emitter of mixer Q73. The G signal is fed from the G output circuit through buffer Q74 to the base of Q73. The B signal is not inverted and appears at the collector of Q73. The G signal is inverted and appears at the collector. The B-G signal thus obtained at the collector of Q73 is supplied through amplifier Q75/Q76 to the PIX output circuit.

VR13 (B-G BALANCE) is a control to adjust the B signal level to match the G signal and VR14 (B-G GAIN) is a control to adjust the B-G signal level.

17-7 G Output Circuit

Outline

This circuit receives the green(G) signal from the camera through the camera cable and sends it to the G output connector on the rear of RCU after compensating the frequency response of G signal depending on the length of camera cable.

Details

The G signal is fed from the camera through pin 26 of CN41 and pin 3 of CN6 to buffer Q82. The G signal at the emitter of Q82 is supplied through VR16 (G OUTPUT GAIN PRESET) and amplifier Q84 to buffer Q93. The signal at the emitter of Q93 is negatively fed back to the base of Q84 to compensate the frequency response of G signal. The level and frequency response of feedback signal is selected by SW6 (CABLE LENGTH COMPENSATION) depending upon the camera cable length for the optimum compensation. When SW6 is set to the 50m position, base potential of Q88 and Q89 becomes high(H) level to turn them ON and the signal at the emitter of Q93 is fed back through R286/C104, Q89 and R227 to the base of Q84. At the same time, R275 and C98 are connected between the feedback loop and ground through Q88.

When SW6 is set to the 100m, 200m or 300m position, switching transistors operate as shown in the Table below and the level and frequency response of feedback signal are changed. When SW6 is set to the 200m or 300m position, Q123 or Q83 connected between the emitters of Q82 and Q84 is also turned ON to compensate the frequency response.

Position of SW6	Q85 Q92	Q86 Q91	Q87 Q90	Q88 Q89	Q123	Q83
50m	OFF	OFF	OFF	ON	OFF	OFF
100m	OFF	OFF	ON	OFF	OFF	OFF
200m	OFF	ON	OFF	OFF	OFF	ON
300m	ON	OFF	OFF	OFF	ON	OFF

The frequency-compensated G signal obtained at the emitter of Q93 is supplied through buffer Q114, VR21 (G OUTPUT GAIN) and amplifier Q115 to G output Q116 - Q118. The G signal at the emitters of Q117/Q118 is sent through pin 3 of CN10 to the G output connector CN36.

The G signal at the emitter of Q93 is also fed to the PIX output circuit and the R-G output circuit and the B-G output circuit.

17-8 Aux Output Circuit

Outline

This circuit receives the lineview signal supplied from the special effects generator to the AUX connector on the rear of the RCU and sends it to the camera through the camera cable.

Details

The lineview signal is fed from the AUX connector CN34/CN35 through pin 3 of CN16 to buffer Q108. The lineview signal obtained at the emitter of Q108 is fed through VR20 (AUX GAIN) and amplifier Q110 to AUX output Q111 - Q113. The lineview signal at the emitters of Q112/Q113 is fed to the camera via pin 3 of CN17 and pin 23 of CN41. When SW6 (CABLE LENGTH COMPENSATION) is set to the 200m or 300m position, potential at the base of Q109 becomes high(H) level to turn it ON and R413/C123 are connected with R346 and VR20 parallelly to compensate the frequency response of lineview signal. The lineview signal at the emitter of Q108 is sent to the PIX output circuit.

17-9 PIX Control Circuit

Outline

This circuit generates PIX control signals with operation of the Monitoring Signal Selection Switch, Registration Switch and -G ON/OFF switch. The PIX control signals are sent to the PIX output circuit to select the PIX output signal.

Details

When the Monitoring Signal Selection Switch SW7, Registration Switch SW8 and -G ON/OFF Switch are set, the PIX control signals (A), (B), (C), (D) and (E) obtained at pins 1, 2, 3, 7 and 8 become as shown in the Table below.

Position of Switch		PIX Control Signal (A)	(B)	(C)	(D)	(E)
Monitoring Signal Selection	ENC	H			H	
	REG	H			L	
	AUX	L			H	
Registration	R			H		L
	G			H		H
	B			L		L
−G ON/OFF	ON		H			
	OFF		L			

These control signals are fed to IC2 and IC5 and converted into three PIX control signals. Three control signals are obtained at pin 4 of IC2 and pins 4 and 10 of IC5 as follows depending upon the position of switches.

Monitoring Signal Selection	Regist-ration	−G ON/OFF	PIX Control Signal		
			Pin 4 of IC2 (A)	Pin 4 of IC5 (B)	Pin 10 of IC5 (C)
ENC	—	—	L	H	L
REG	R	ON	H	L	H
		OFF	H	L	L
	G	ON	L	L	H
		OFF	L	L	L
	B	ON	H	H	H
		OFF	H	H	L
AUX	—	—	L	H	H

17-10 PIX Output Circuit

Outline

This circuit receives the PAL, red(R), green(G), blue-(B), R-G, B-G and AUX (lineview) signal. One of these signals is selected by the PIX control signals supplied from the PIX control circuit and it is sent to the PIX connector on the rear of remote control unit (RCU).

Details

The G, R, PAL, B, R-G, lineview and B-G signals are supplied from the respective circuits to X0 (pin 13), X1 (pin 14), X2 (pin 15), X3 (pin 12), X5 (pin 5), X6 (pin 2) and X7 (pin 4) terminal of analog switch IC3. X4 (pin 1) is grounded for no signal. One of these signals is selected by the potential at A, B and C control terminals (pins 11, 10 and 9) of IC3 as shown in the Table below.

Monitoring Signal Selection	Regist-ration	−G ON/OFF	PIX Control Signal (IC3 and IC4)			Connection of IC3 and IC4	Selected Signal by IC3	Sync Level
			Pin 11 (A)	Pin 10 (B)	Pin 9 (C)			
ENC	–	–	L	H	L	X2 (Pin 15)	PAL	Zero
REG	R	ON	H	L	H	X5 (Pin 5)	R−G	0.6V
		OFF	H	L	L	X1 (Pin 14)	R	0.3V
	G	ON	L	L	H	X4 (Pin 1)	Ground	0.6V
		OFF	L	L	L	X0 (Pin 13)	G	0.3V
	B	ON	H	H	H	X7 (Pin 4)	B−G	0.6V
		OFF	H	H	L	X3 (Pin 12)	B	0.3V
AUX	–	–	L	H	H	X6 (Pin 2)	AUX	Zero

When the Monitoring Signal Selection Switch is set to the ENC position, low(L), high(H) and low(L) levels are sent from the PIX control circuit to A (pin 11), B (pin 10) and C (pin 9) control terminal of IC3 and X2 (pin 15) and X (pin 3) terminals are connected. Therefore the PAL signal supplied to X2 (pin 15) terminal is selected. When the Monitoring Signal Selection Switch, Registration Switch and -G ON/OFF Switch are set, the respective signal is selected in IC3 as shown in the above Table.

The selected signal at pin 3 of IC3 is fed through buffer Q94 and VR17 (PIX GAIN) to the emitter of amplifier Q95. The sync signal is sent to the base of Q95 and it is mixed with the selected signal.

The DC level fed to X0 - X7 terminals of analog switch IC4 are selected by the PIX control signal supplied from the PIX control circuit to A (pin 11), B (pin 10) and C (pin 9) control terminals of IC4. The selected DC level at pin 3 of IC4 is sent to low level clip circuit consisting of Q99 and Q100 and sets the level of sync signal, supplied to the base of Q100 from the sync separation circuit, by clipping the low level of sync signal. The positive sync signal is then fed to the base of Q95 and mixed with the selected signal. When the PAL or lineview (AUX) signal is selected, no sync is mixed. When R, G or B signal is selected 0.3V sync signal adjusted by VR18 (R, G, B SYNC LEVEL) is mixed. When the R-G, B-G and G-G (zero) signal is selected, 0.6V sync is mixed.

The selected signal which is mixed with the sync signal and obtained at the collector of Q95 is fed through PIX output Q96 - Q98 and pin 3 of CN7 to the PIX output connector CN40.

17-11 AWC/ABC Control Circuit

Outline

When the camera is used with the remote control unit (RCU), the automatic white and black balance is set from the RCU. This circuit sends the trigger signal for the setting to the camera.

Details

When the Auto/Manual Selection Switch SW3 is set to the AUTO position, high (H) level is sent through R341, pin 2 of CN15 and pin 16 of CN41 to the camera. When it is set to the MANUAL position, low (L) level is fed to the camera.

When the Auto White/Auto Black Set Switch SW2 is depressed to the AWC or ABC position, potential at cross point of R340 and C120 becomes L level momentarily due to discharge of C120. The L level is fed through pin 3 of CN15 and pin 15 of CN41 to the camera.

When the Auto White/Auto Black Set Switch SW2 is depressed to the ABC position, potential at cross point of R338 and C118 becomes L level momentarily due to discharge of C118. The L level is supplied via pin 4 of CN15 and pin 14 of CN41 to the camera.

17-12 Intercom Circuit

Outline

This circuit receives the intercom signal from the special effects generator in the system application for oral communication between the camera operators and director. After amplifying signal, it is sent to the intercom jack on the camera and the RCU.

Details

The intercom signal supplied to pin 3 of the Tally & Intercom connector CN42 is sent through buffer Q103 to amplifier Q104. The amplified signal at the collector of Q104 is routed through buffer Q105, pin 3 of CN13 and pin 30 of CN41 to the camera. The potential which is set by the camera/Color Bar Selection Switch SW4 is mixed with the intercom signal through R328 and sent to the camera for the selection of camera or color bar picture. The signal obtained at the collector of Q104 is applied through buffer Q106, the Intercom Level Control VR45 to the Intercom Jack CN43. The intercom signal at pin 1 of CN19 is returned through buffer Q107 to pin 4 of the Tally & Intercom connector CN42.

17-13 Tally Control Circuit

Outline

This circuit receives the tally control signal from the special effects generator in the system when the picture of camera is selected into the line output, and sends the control signal to the tally LED/lamp on the camera and the remote control unit (RCU) to light them.

Details

When the picture of the camera is selected into the line output by the special effects generator in the system, pins 1 and 2 of the Tally & Intercom connector CN42 are connected. The low (L) level at the base of Q101 turns ON Q101 and Q102. Therefore, tally LED D22 on the RCU lights. The high(H) level at the collector of Q101 is sent through pin 7 of CN15 and pin 17 of CN41 to light the tally LED/lamp on the camera.

17-14 Gain/Pedestal Control Circuit

Outline

When the camera is used with the remote control unit (RCU), the gain of pedestal of red(R), blue(B) and luminance signals are controlled from the RCU.

Details

The DC voltages set by VR26 (R GAIN), VR27 (B GAIN), VR30 (TOTAL PEDESTAL), VR31 (R PEDESTAL) and VR34 (B PEDESTAL) are fed to the camera through CN41 respectively.

VR25 (R GAIN PRESET), VR28 (B GAIN PRESET), VR29 (TOTAL PEDESTAL PRESET), VR32 (P PEDESTAL PRESET) and VR33 (B PEDESTAL PRESET) are preset controls.

17-15 Centering Control Circuit

Outline

When the camera is used with the remote control unit (RCU), the horizontal and vertical centering for red(R) and blue(B) images is controlled from the RCU.

Details

The DC voltages set by VR36 (R H-CENTERING), VR37 (B H-CENTERING), VR40 (R V-CENTERING) and VR41 (B V-CENTERING) are sent to the camera through CN41 to control the centering. VR35, VR36, VR39 and VR42 are preset controls.

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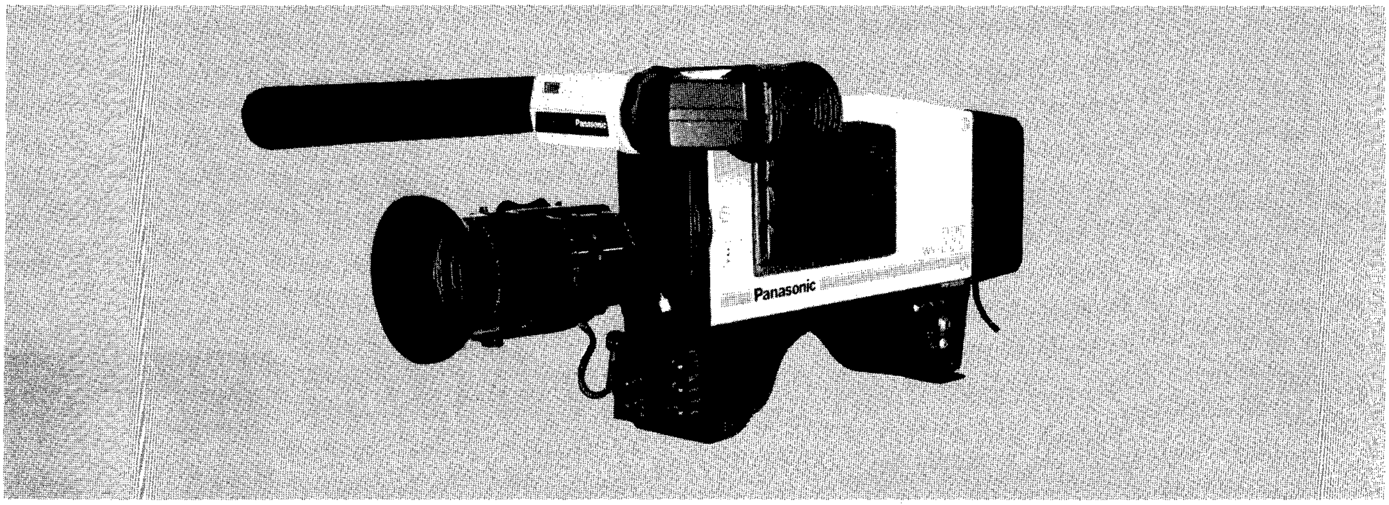
Service Manual

Vol. 2

Adjustment Procedures

Colour Video Camera

WV-777 Series



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* Refer to the separate booklet for the test points and adjusting contrlos.

Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

1. Test Equipment Required

The following test equipment is required for adjustment of color video camera model WV-777.

- Oscilloscope
  (dual trace, delayed sweep, 30MHz band width, with three probes)
- Digital voltmeter (DVM)
- Low frequency sine wave signal generator
- DC power supply (10 ~ 15V variable, more than 2.5A)
- Crosshatch pattern generator
- Signal generator or special effects generator
- Frequency counter
- PAL vectorscope
- Waveform monitor
- Color video monitor
- Monochrome underscanned video monitor
- Tripod mounting adaptor
- Tripod
- AC adaptor (WV-PS30)
- Lighting 2000 lux, 3200°K
- Logarithmic gray scale chart (Part No. YWV2310RB99)

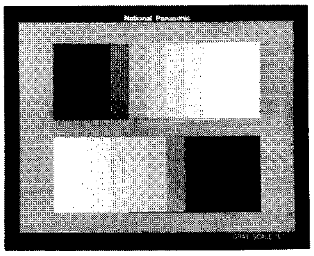


Fig. 1-1

- Registration chart

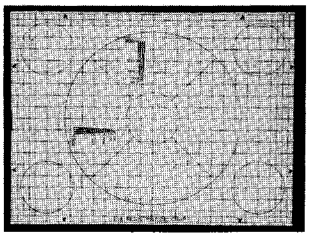


Fig. 1-2

- Linearity chart

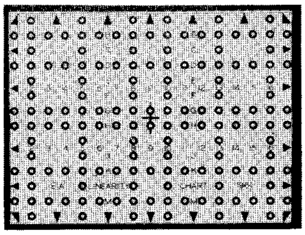


Fig. 1-3

Test equipment denoted by shaded outlines are not required if only pick-up tube are replaced.

- In-mega cycle test chart

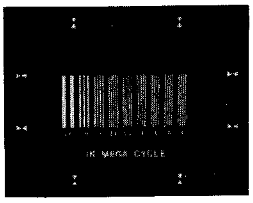


Fig. 1-4

- Resolution chart (Part No. YWV1400RB99)

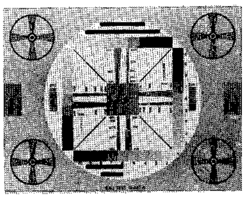
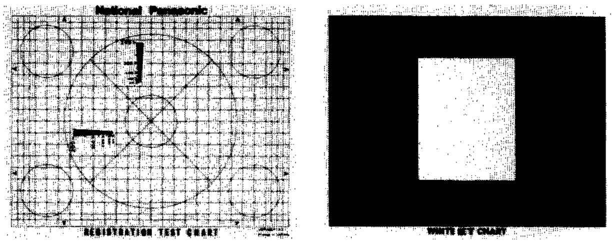


Fig. 1-5

- White set (window) and registration chart (Standard accessory, Part No. YFV8RA0011A3)



Front

Rear

Fig. 1-6

- Extension board-1 (Standard accessory, Part No. YFVPKP77751A)

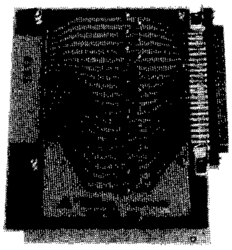


Fig. 1-7

- Extension board-2 (Standard accessory, Part No. YFVPKP77752A)

Fig. 1-8

- Luxmeter
  We recommend one of the following.
  A. Portable Luxmeter Model No. 3281 by Yokogawa Electric Workers.
  B. Electronic Foot Candle Meter by Pax Lux.

2. Disassembling Procedure for Adjustment

2-1 Camera

- Loosen four screws which hold side cover and remove the side cover.

(A) For left side cover (viewed from the front) (Fig. 2-1-1)

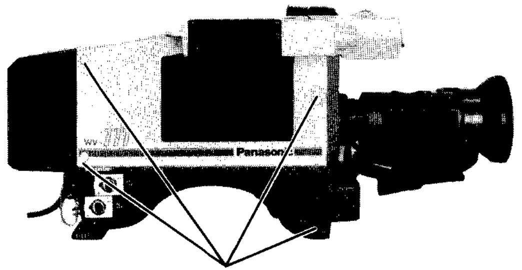

Loosen four screws

Fig. 2-1-1

(B) For right side cover (viewed from the front) (Fig. 2-1-2)

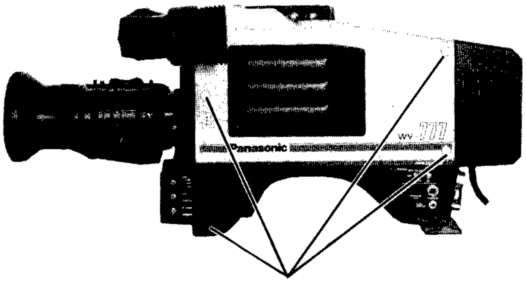

Loosen four screws

Fig. 2-1-2

2-2 1.5" Viewfinder WV-VF30

- Remove the rubber eye cap from the viewfinder by pulling while lifting the center portion of eye cap. (Fig. 2-2-1)

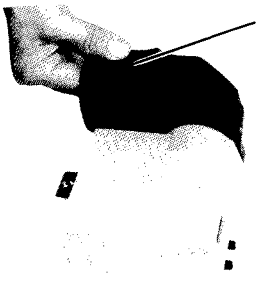

Pull while
lifting the
center portion

Fig. 2-2-1

- Remove the stopper spring for viewfinder optical focus adjuster and remove the adjuster by turning it counterclockwise. (Fig. 2-2-2)

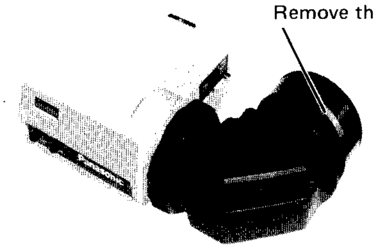

Remove the spring

Fig. 2-2-2

- Remove the viewfinder tilt lock ring by turning it counterclockwise. (Fig. 2-2-3)

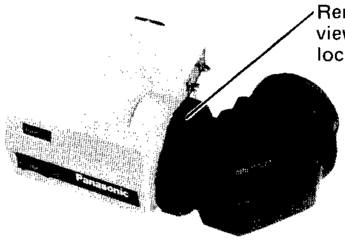

Remove the
viewfinder tilt
lock ring

Fig. 2-2-3

- Remove one screw fixing the viewfinder case and loosen two screws for viewfinder connector. (Fig. 2-2-4)

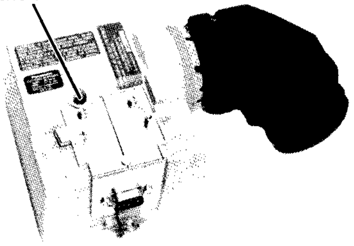

Remove the screw

Fig. 2-2-4

- Remove the upper case by pulling it. (Fig. 2-2-5)

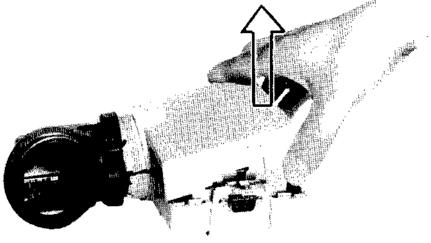

Pull this side

Fig. 2-2-5

2-3 5" Viewfinder WV-VF35

- Remove five screws fixing the upper cover and remove the cover. (Fig. 2-3-1)

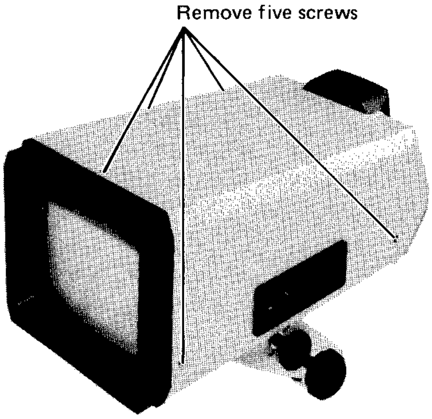

Remove five screws

Fig. 2-3-1

2-4 Remote Control Unit WV-RC30

- Remove six screws fixing the upper panel and remove the panel. (Fig. 2-4-1)

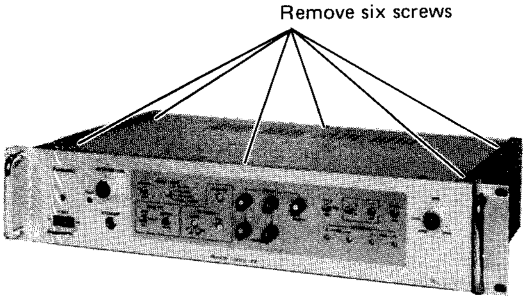

Remove six screws

Fig. 2-4-1

3. Pick-up Tube Replacement

- Disassemble the camera while referring to 2. Disassembling Procedure for Adjustment on page 2.

3-1 Blue Pick-up Tube Replacement

- Remove two screws which hold the Deflection board and swing out the Deflection board. (Fig. 3-1-1)

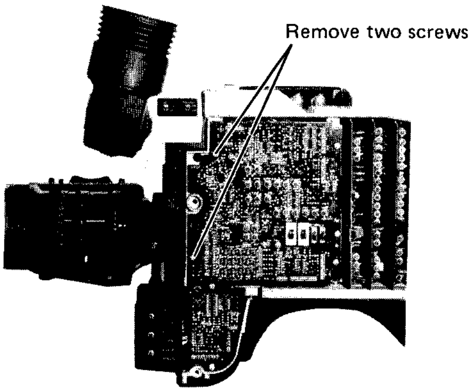

Remove two screws

Fig. 3-1-1

- Loosen the viewfinder fixing screw and slide out the viewfinder. (Fig. 3-1-2)

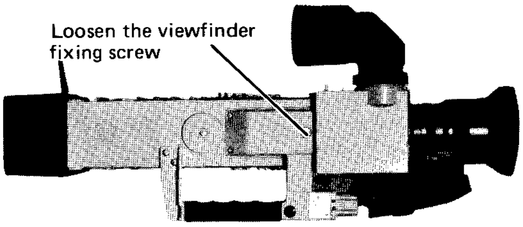

Loosen the viewfinder fixing screw

Fig. 3-1-2

- Remove six screws which hold the handle (Figs. 3-1-3 & 3-1-4) and remove the handle by disconnecting the 3-pin connector.

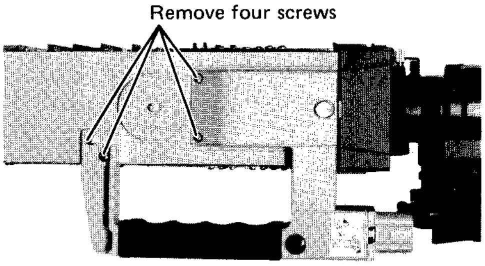

Remove four screws

Fig. 3-1-3

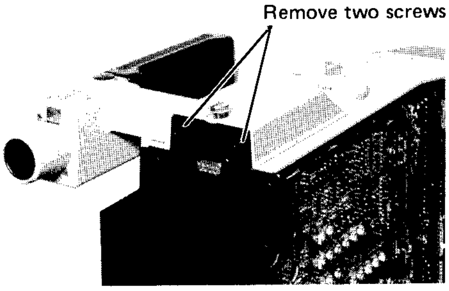

Remove two screws

Fig. 3-1-4

- Disconnect the tube socket from the pick-up tube for blue channel. (Fig. 3-1-5)
- Remove the tube holding ring by turning it counter-clockwise. (Fig. 3-1-5)

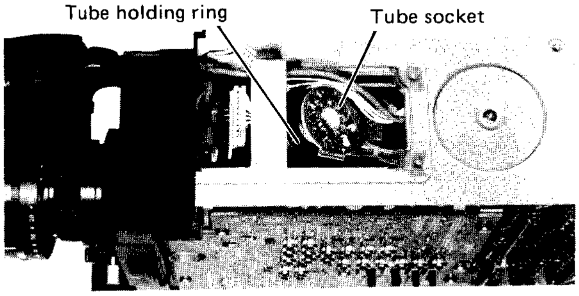

Tube holding ring
Tube socket

Fig. 3-1-5

- Pull the tube out from the deflection coil. (Fig. 3-1-6)

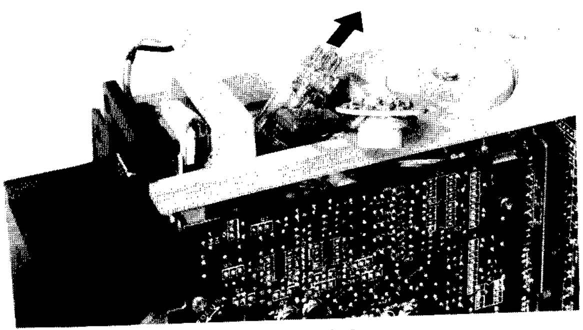


Fig. 3-1-6

- Clean the faceplate of new tube (Part No. H4101) with the lens cleaning tissue or cloth.
- Insert the new pick-up tube into the deflection coil and push it completely until it stops.

Note : 1. When inserting the tube in place, be careful not to expose the target directly to bright light.
2. Make sure that the pick-up tube is positioned correctly, i.e., the blank pin portion of tube positions right side as shown below. (Fig. 3-1-7)

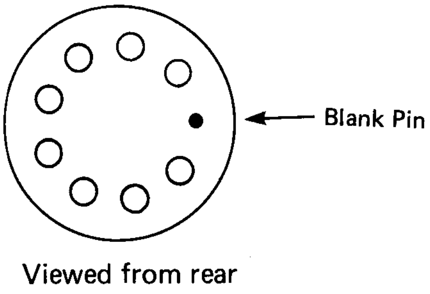

Blank Pin
Viewed from rear

Fig. 3-1-7

- Install the tube holding ring and tighten it to secure the pick-up tube.
- Seat the tube socket to the blue pick-up tube.

3-2 Green Pick-up Tube Replacement

- Remove six circuit boards from the Mother board by pulling them. (Fig. 3-2-1)

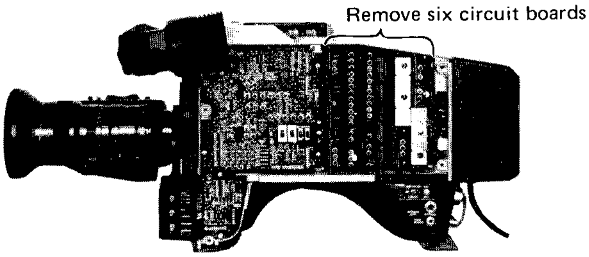

Remove six circuit boards

Fig. 3-2-1

- Remove two screws which hold the Deflection board and swing it out. (Fig. 3-2-2)

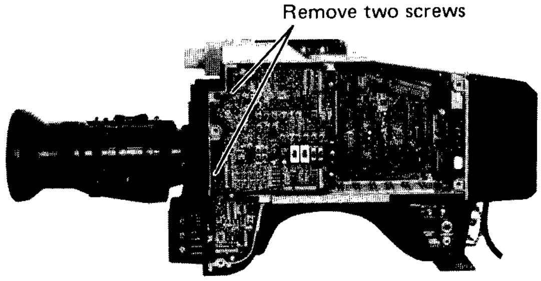

Remove two screws

Fig. 3-2-2

- Disconnect the tube socket from the pick-up tube for green channel. (Fig. 3-2-3)
- Remove the tube holding ring by turning it counter-clockwise. (Fig. 3-2-3)

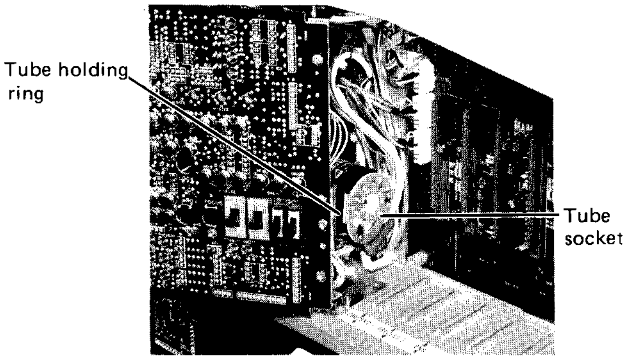

Tube holding ring
Tube socket

Fig. 3-2-3

- Pull out the pick-up tube from the deflection coil (Fig. 3-2-4).

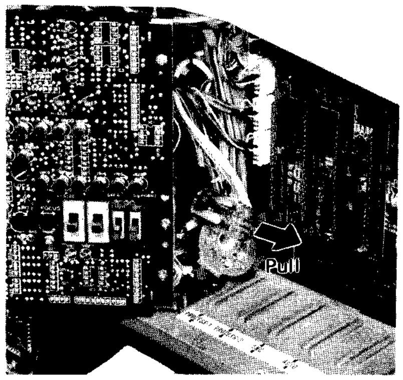
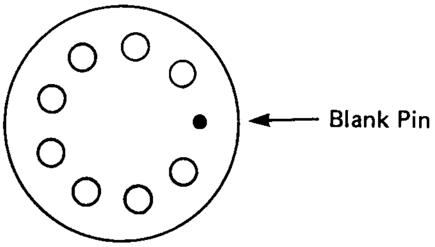


Fig. 3-2-4

- Clean the faceplate of now tube (Part No. H4101) with the lens cleaning tissue or cloth.
- Insert the new pick-up tube into the deflection coil and push it completely until it stops.

Note:
1. When inserting the pick-up tube in place, be careful not to expose the target directly to bright light.
2. Make sure that the pick-up tube is positioned correctly, i.e., the blank pin portion of tube positions right side as shown below. (Fig. 3-2-5)



Viewed from rear

Fig. 3-2-5

- Install the tube holding ring and tighten it to secure the pick-up tube.
- Seat the tube socket to the green tube.
- Insert six circuit boards to the mother board while referring to the PCB indication label.

3-3 Red Pick-up Tube Replacement

- Remove three screws which hold the shoulder pad and remove the shoulder pad. (Fig. 3-3-1)

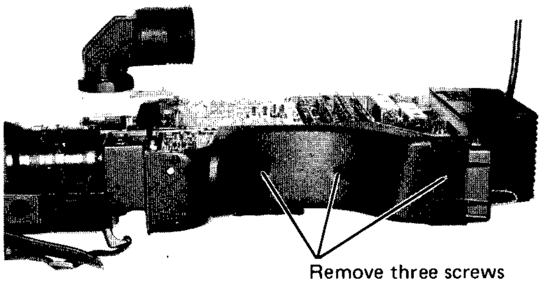


Fig. 3-3-1

- Remove two screws which hold lower panel and remove the panel. (Fig. 3-3-2)

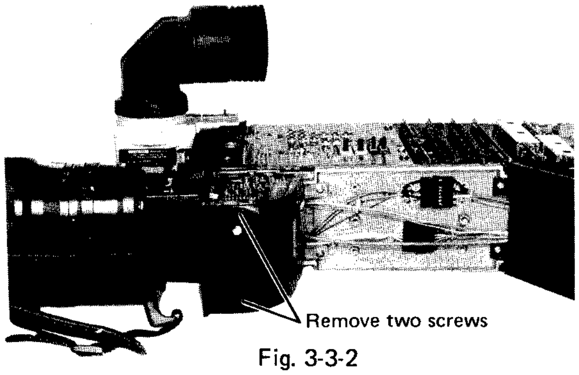


Fig. 3-3-2

- Disconnect the tube socket from the pick-up tube for red channel. (Fig. 3-3-3)
- Remove the tube holding ring by turning it counterclockwise. (Fig. 3-3-3)

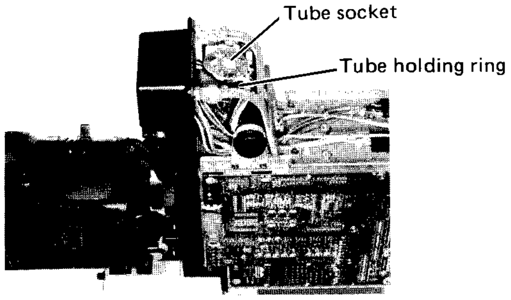


Fig. 3-3-3

- Pull out the pick-up tube from the deflection coil. (Fig. 3-3-4)

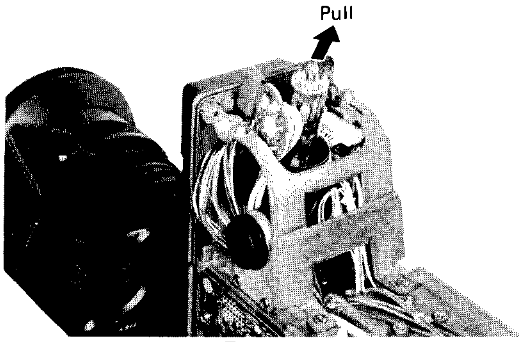
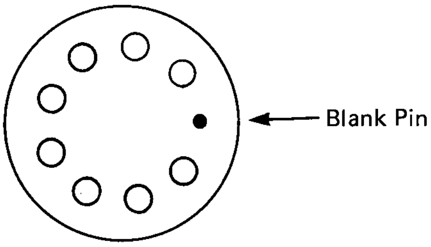


Fig. 3-3-4

- Clean the faceplate of new tube (Part No. H4101) with the lens cleaning tissue or cloth.
- Insert the new tube into the deflection coil and push it completely until it stops.

Note:
1. When inserting the pick-up tube in place, be carful not to expose the target directly to bright light.
2. Make sure that the pick-up tube is positioned correctly, i.e., the blank pin portion of tube positions right side as shown below. (Fig. 3-3-5)



Viewed from rear

Fig. 3-3-5

- Install the tube holding ring and tighten it to secure the pick-up tube.
- Seat the tube socket to the red tube.

4. Adjustment Procedure

4-1 Connection and Setting Up for Adjustment

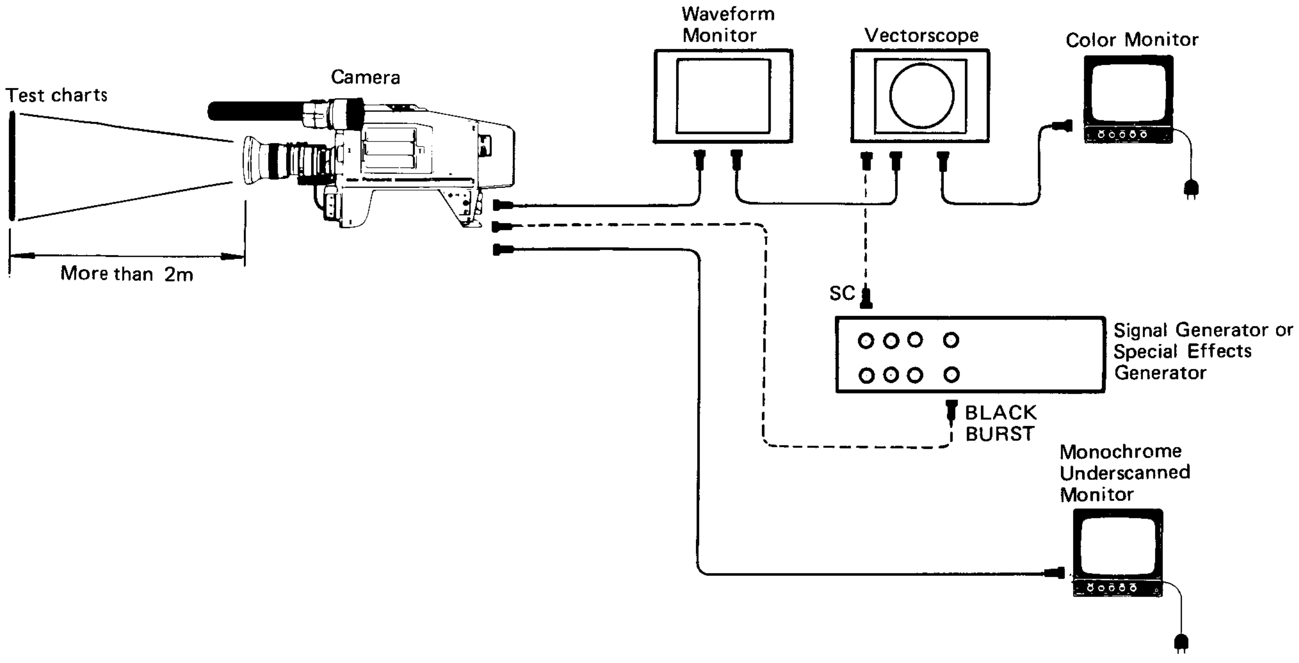


Fig. 4-1-1

Connection

- Connect the VIDEO OUT connector on the rear of camera to the VIDEO IN connector of color video monitor through the waveform monitor and vectorscope using coaxial cables.
- Terminate the video input of color video monitor with 75 ohms.
- Connect the PIX OUT connector on the rear of camera to the VIDEO IN of monochrome underscanned video monitor using a coaxial cable.
- Terminate the video input of monochrome video monitor with 75 ohms.
- Connect the BLACK BURST OUT of special effects generator or signal generator to the GEN-LOCK connector on the rear of camera using a coaxial cable when instructed.
- Connect the SC (subcarrier) OUT of special effects generator or signal generator to the external subcarrier reference (EXT CW ϕ REF) connector of vectorscope using a coaxial cable when instructed.

Position of Controls and Switches on the Camera

(Front)

Auto/Manual Selection Switch	MANUAL

(Right Side) - Viewed from front -

Filter Wheel	1
High Gain Selection Switch	0 dB
Color Bar/Camera Selection Switch	CAMERA
Standby/Operate Selection Switch	OPERATE
VTR-RCU Selector Switch	VTR

(Inside Right Control Panel) - Viewed from front -

Monitoring Signal Selection Switch	ENC
Registration Switch	G
−G ON/OFF Switch	OFF
Detail ON/OFF Switch	OFF

(Inside Left Control Panel) - Viewed from front -

Red Gain Control	Center
Blue Gain Control	Center
Red Pedestal Control	Center
Blue Pedestal Control	Center
Total Pedestal Control	Center

(Lens)

Iris Control Selection Switch	MAN
Servo/Manual Zoom Select Knob	MANUAL
Flangeback Adjusting Ring	Standard (▶ | ●)

Set-up

- Turn on the color camera for at least 30 minutes prior to adjustment.
- Distance between the camera and test chart should be more than 2m.
- Light : 2000 lux incident

Extension Board

- When adjusting the Process-1, Process-2, Encoder, Sync-1 and Sync-2 board, use the extension boards (standard accessories) as show in Fig. 4-1-2.
  Two extension boards (Part No. YFVPKP77751A, YFVPKP77752A) are required for the Process-1 board. One extension board (Part No. YFVPKP77751A) is required for other board.

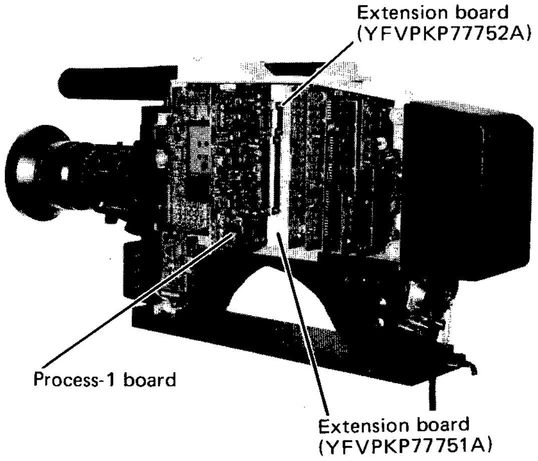


Fig. 4-1-2

4-2 Power Supply Adjustment

- Refer to the separate booklet for the test points and adjusting controls.

(a) +9V adjustment (Sync-2 board)

Test points :	TP15 (+9V)	Mother board
	TP20 (GND)	〃 〃
Adjust :	VR6 (+9V ADJ)	Sync-2 board

- Connect the digital voltmeter (DVM) probe between TP15 and TP20 (GND) on the mother board.
- Adjust +9V ADJ VR6 for +9V ±0.1V.

(b) Battery warning adjustment (Sync-2 board)

Test points :	TP21 (+12V)	Mother board
	Pin 21 of CN8	Sync-2 board
Adjust :	VR5 (BATTERY WARNING)	〃 〃

- Disconnect the AC adaptor from the camera.
- Supply +12V DC between pin 2 (+) and pin 9 (GND) of battery connector on the rear of camera, or pin 4 (+) and pin 1 (GND) (for 4 pin connector) or pin 2 (+) and pin 1 (GND) (for 3 pin connector) of the external DC input connector on the side of camera from the DC power supply. (Fig. 4-2-1)

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

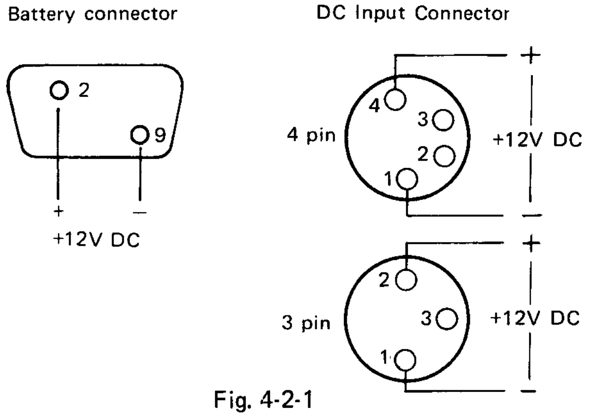


Fig. 4-2-1

- Connect the DVM probe between TP21 and TP20 (GND) on the Mother board.
- Set the DC power supply voltage so that voltage at TP21 is 11.7V.
- Connect the oscilloscope to pin 21 of CN8 (connector for Sync-2 board).
- Trigger the oscilloscope at V rate (Use TP19, Mother board).
- Turn BATTERY WARNING VR5 fully clockwise, and turn it back slowly and stop it when the battery warning signal just appears at pin 21 of CN8 (Fig. 4-2-2) and the battery warning indicator (BATT) in the 1.5" electronic viewfinder just flashes.

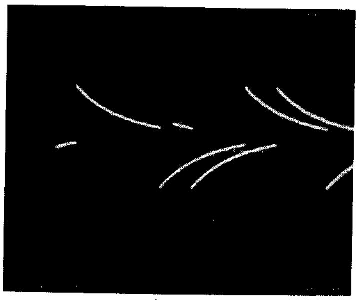


Fig. 4-2-2

- Reduce the DC power supply voltage gradually from 14V and confirm that the battery warning signal appears at pin 21 of CN8 and the battery warning indicator flashes when the voltage at TP21 becomes 11.7V.
- Disconnect the DC power supply from the battery connector of the camera.
- Mount the AC adaptor to the camera.

(c) –9V adjustment (High voltage board)

Test point :	Pin 10 of CN16	Mother board
Adjust :	VR10 (-9V ADJ)	High voltage board

- Connect the DVM probe between the pin 10 of CN16 on the Mother board and ground.
- Adjust –9V ADJ VR10 on the High voltage board for –9V ±0.1V.

4-3 Sync-1 and Sync-2 Board Adjustment

- Refer the separate booklet for the test points and adjusting controls.

(a) 4.43MHz adjustment (Sync-1 board)

Test point :	TP3 (SC)	Sync-1 board
Adjust :	CT1 (4.43MHz ADJ)	" "

- Connect the frequency counter to TP3 and ground.
- Adjust 4.43MHz ADJ CT1 for 4.433618MHz ±3Hz.

(b) Phase lock adjustment (Sync-1 board)

Test points :	TP1	Sync-1 board
	TP2	" "
Adjust :	CT2 (PHASE LOCK ADJ)	" "

- Connect the oscilloscope to TP1 and TP2 on the Sync-1 board.
- Trigger the oscilloscope at V rate (Use TP19, Mother board).
- Turn PHASE LOCK ADJ CT2 clockwise and counter-clockwise slowly and confirm the lock range of CT2 in which the signal at TP1 is stable and its phase coincides with the VD pulse at TP2. (Fig. 4-3-1)

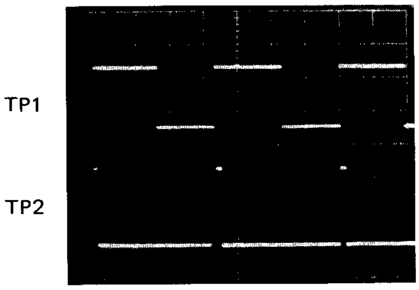


Fig. 4-3-1

- Adjust CT2 at the center of its lock range.
- Turn OFF the power switch and turn it ON again. Confirm that the signal at TP1 is stabilized within three (3) seconds.

(c) Blanking width adjustment

Test points :	TP14 (ENC BL)	Mother board
	TP16 (PRE BL)	
Adjusts :	VR1 (PRE BLANKING)	Sync-1 board
	VR2 (ENCODER BLANKING)	" "

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

- Connect the oscilloscope to TP14 on the Mother board.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust ENCODER BLANKING VR2 on the Sync-1 board so that the encoder blanking width is 10.8 μsec. (Fig. 4-3-2)

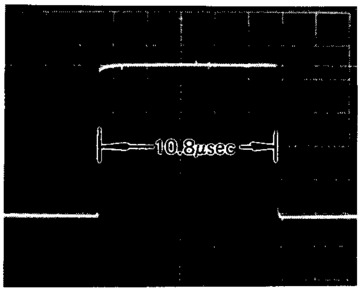


Fig. 4-3-2

- Remove the probe from TP14 to TP16 on the Mother board.
- Adjust PRE BLANKING VR1 on the Sync-1 board so that the preblanking width is 10 μsec. (Fig. 4-3-3)

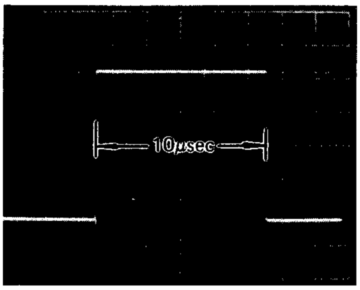
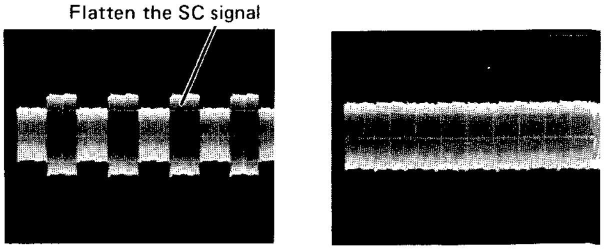


Fig. 4-3-3

(d) R-Y(V) subcarrier balance adjustment

Test point :	TP4 [R-Y(V) SC]	Sync-1 board
Adjust :	VR3 [R-Y(V) SC BALANCE]	" "

- Connect the oscilloscope to TP4.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust R-Y(V) SC BALANCE VR3 so that the SC levels of odd and even fields are equal. (Fig. 4-3-4)



NO GOOD

GOOD

Fig. 4-3-4

(e) Horizontal lock adjustment

Test point :	TP6	Sync-2 board
Adjust :	CT1 (H LOCK)	〃 〃

- Supply a Color bar or Black Burst signal to the GEN-LOCK connector on the rear of camera from the signal generator or special effects generator.
- Connect the digital voltmeter probe to TP6.
- Adjust H LOCK CT1 for +2.5V DC.

(f) Field detect and V reset pulse adjustment

Test points:	TP1	Sync-2 board
	TP3	〃 〃
	TP4	〃 〃
	Pin 16 of CN8	〃 〃
	TP12	Mother board
Adjusts:	VR2 (FIELD DETECT)	Sync-2 board
	VR3 (V RESET PULSE)	〃 〃

- ■ **Adjustment using fv/4 (12.5 Hz) trigger of signal generator.**
- Keep the Color Bar or Black Burst signal connected as in the preceding step.
- Connect the oscilloscope to TP1.
- Trigger the oscilloscope with fv/4 (12.5Hz) signal (Use fv/4 trigger terminal of signal generator).
- Use the delayed sweep mode of oscilloscope to observe the first burst signal portion in the third field. (Fig. 4-3-5)

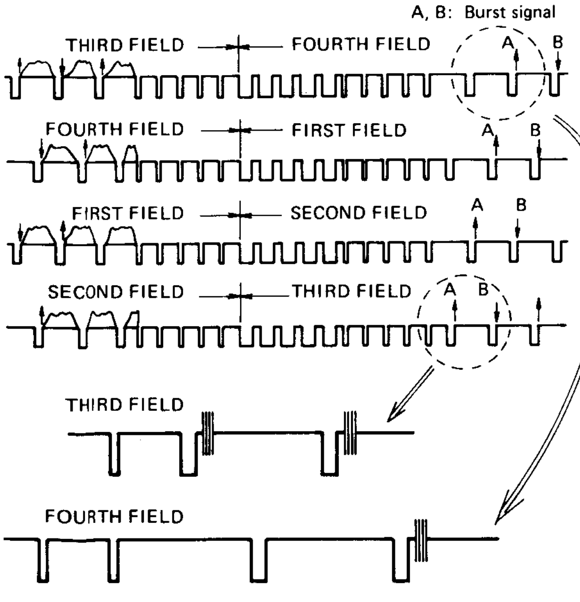


Fig. 4-3-5

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

- Connect the oscilloscope to TP1 (previously connected) and TP3.
- While observing the first burst signal portion in the third field of gen-lock signal at TP1, adjust FIELD DETECT VR2 so that the decay timing of field detect pulse positions as shown below. (Fig. 4-3-6)

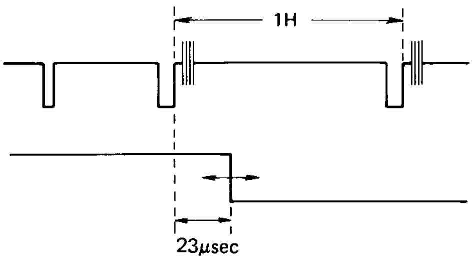


Fig. 4-3-6

- Move the probe from TP3 to pin 16 of CN8 (connector for Sync-2 board).
- While observing the fourth field of gen-lock signal, adjust V RESET PULSE VR3 so that the pulse for making the V reset pulse at pin 16 of CN8 positions as shown below. (Fig. 4-3-7)

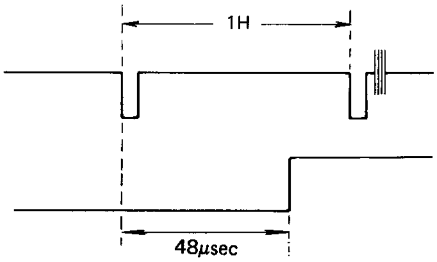
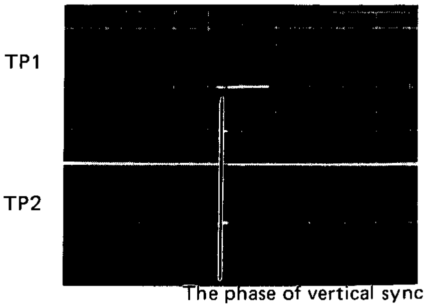


Fig. 4-3-7

- Connect the oscilloscope to TP1 on the Sync-2 board and TP12 on the mother board.
- Trigger the oscilloscope at V rate (Use TP19, Mother board).
- Confirm that the phase of vertical sync signal at TP1 and TP12 is coincident. (Fig. 4-3-8).

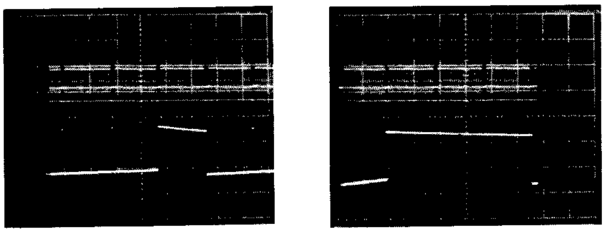


The phase of vertical sync signal is coincide.

Fig. 4-3-8

■ Adjustment without using fv/4 (12.5 Hz) trigger of signal generator.

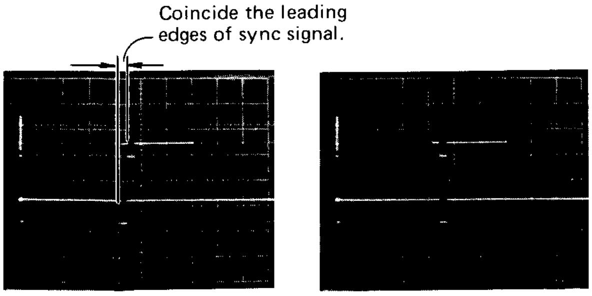
- Keep the Color Bar or Black burst signal connected as in the preceding step.
- Connect the oscilloscope to TP1 and TP4 on the Sync-2 board.
- Trigger the oscilloscope with TP4 on the Sync-2 board.
- Turn FIELD DETECT VR2 clockwise and counter-clockwise slowly and note the lock range where the pulse (whose frequency is fv/4 and pulse width is one vertical period) is obtained at TP4. (Fig. 4-3-9).



NO GOOD GOOD

Fig. 4-3-9

- Adjust VR2 to the center of noted range.
- Move the probe from TP4 to TP12 on the Mother board.
- Turn V RESET PULSE VR3 clockwise and counter-clockwise slowly and not the adjusting range of VR3 where the leading edges of sync signals are coincident. (Fig. 4-3-10)



NO GOOD GOOD

Fig. 4-3-10

- Adjust VR3 to the center of noted range.

(g) Horizontal phase adjustment (Sync-1 board)

Test points :	TP1	Sync-2 board
	TP12	Mother board
Adjust :	VR4 (H PHASE)	Sync-1 board

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

- Keep the Color Bar or Black Burst signal connected as in the preceding step.
- Connect the oscilloscope to TP1 on the Sync-2 board and TP12 on the Mother board.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Expand the H sync period on the oscilloscope.
- Confirm that the sync of gen-lock signal at TP1 leads by more than 0.1 µsec and lags more than 3.5 µsec the sync signal at TP12 as H PHASE VR4 on the Sync-1 board is turned through its range. (Fig. 4-3-11)

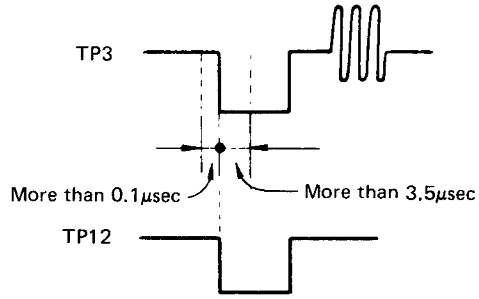


Fig. 4-3-11

- After confirming the above step, adjust VR4 so that the leading edges of both sync signals are coincident.

(h) Burst gate preset adjustment

Test points :	TP1	Sync-2 board
	TP2	" "
Adjust :	VR1 (BURST GATE PULSE)	" "

- Keep the Color Bar or Black Burst signal connected as in the preceding step.
- Connect the oscilloscope to TP1 and TP2.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust BURST GATE PULSE VR1 so that the phase of burst gate pulse is as shown below. (Fig. 4-3-12)

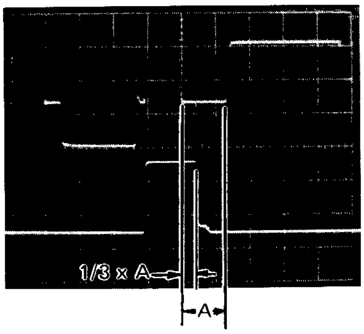
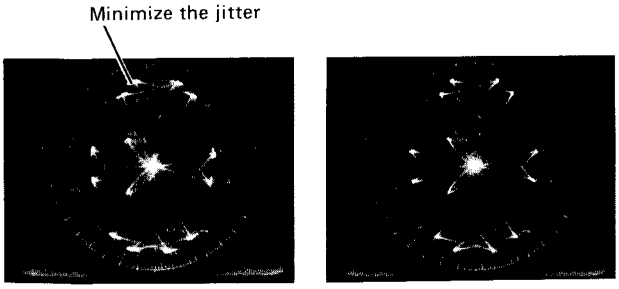


Fig. 4-3-12

(i) Color lock adjustment

Test points :	TP5	Sync-2 board
	VIDEO OUT	
Adjusts :	VR4 (COLOR LOCK)	" "
	VR1 (BURST GATE PULSE)	" "
Observe :	Vectorscope	

- Keep the Color Bar or Black Burst signal connected as in the preceding step.
- Connect the VIDEO OUT on the rear of camera to the vectorscope.
- Set the Color Bar/Camera Selection Switch on the side of camera to the BAR position.
- Adjust VR4 so that the jitter of color bar on the vectorscope is minimum. (Fig. 4-3-13)



NO GOOD GOOD

Fig. 4-3-13

- Adjust BURST GATE PULSE VR1 so that the jitter of color bar on the vectorscope is minimum.
- Repeat adjusting VR4 and VR1 so that the jitter is minimum.

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

(j) Confirmation of subcarrier phase

Test point :	VIDEO OUT	
Adjusts :	SW1 (SC PHASE COARSE SWITCH)	Sync-1 board
	VR5 (SC PHASE FINE)	" "
Observe :	Vectorscope	

- Keep the Color Bar or Black Burst signal connected to the GEN-LOCK connector as in the preceding step.
- Keep the Color Bar/Camera Selection Switch set to the BAR position.
- Supply an external subcarrier signal to the external subcarrier reference (EXT CW ϕ REF) connector of vectorscope from the signal generator or special effects generator.
- Set the burst mode of the vectorscope to the EXT position.
- Set the SC PHASE COARSE SWITCH SW1 to the 0° position and turn SC PHASE FINE VR5 fully counterclockwise.
- Confirm that the burst phase changes 120° and 240° when SC PHASE COARSE SWITCH SW1 is set to the 120° and 240° position.
- Confirm that the burst phase changes more than 120° when VR5 is turned back. (The burst phase changes more than 360° by setting SW1 and VR5).
- Reset SW1 to the 0° position and return VR5 fully counterclockwise.
- Disconnect the Color Bar or Black Burst signal from the GEN-LOCK connector.

4-4 Encoder Board Adjustment

- Refer to the separate booklet for the test points and adjusting controls.
- Set the Color Bar/Camera Selection Switch to the BAR position.
- Set U/V ON/OFF SWITCH SW1 on the Encoder board to the center (ON) position.

(a) Color bar width adjustment

Test points :	TP4 (Y)	Encoder board
	TP13 (BL)	Mother board
Adjust :	VR1 (BAR WIDTH)	Encoder board

- Connect the oscilloscope to TP4 and TP13 on the Mother board.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust BAR WIDTH VR1 so that the black bar width is 6.2 μsec as shown in Fig. 4-4-1.

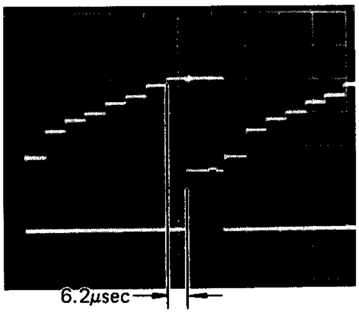


Fig. 4-4-1

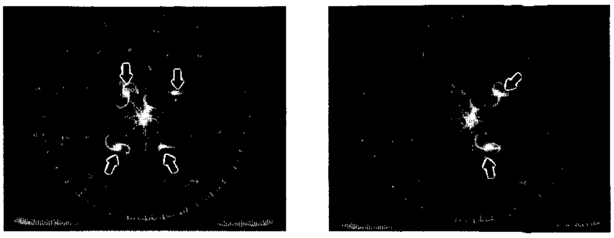
(b) Carrier balance and white balance adjustment

Test point :	VIDEO OUT	Encoder board
	VR2 (V WHITE BALANCE)	" "
	VR4 (U WHITE BALANCE)	" "
	VR6 (V CARRIER BALANCE)	" "
	VR7 (U CARRIER BALANCE)	" "
Observe :	Vectorscope	

■ Adjustment using the vectorscope

- Connect the VIDEO OUT connector on the rear of camera to the terminated vectorscope.
- Set the gain of the vectorscope to the maximum.
- While observing the vectorscope, adjust V WHITE BALANCE VR2 and U WHITE BALANCE VR4 repeatedly so that the four dots become two dots. (Fig. 4-4-2)

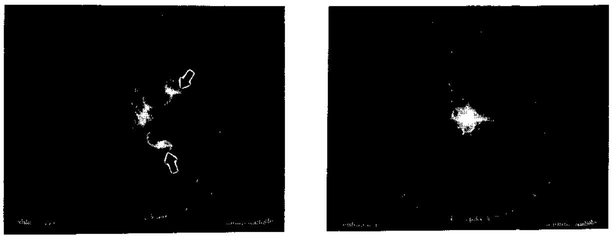
Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.



NO GOOD GOOD

Fig. 4-4-2

- Adjust V CARRIER BALANCE VR6 and U CARRIER BALANCE VR7 repeatedly so that two dots meet each other and position at the center of the vectorscope. (Fig. 4-4-3)



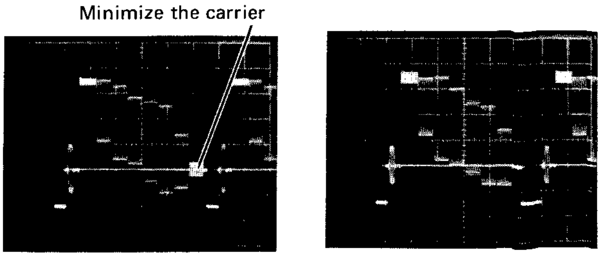
NO GOOD GOOD

Fig. 4-4-3

- Repeat fine-adjusting VR2, VR4, VR6 and VR7 so that four dots meet each other and position at the center of the vectorscope.
- After completing the above adjustment, reset the gain of the vectorscope to the 75% position.

■ Adjustment using oscilloscope or waveform monitor

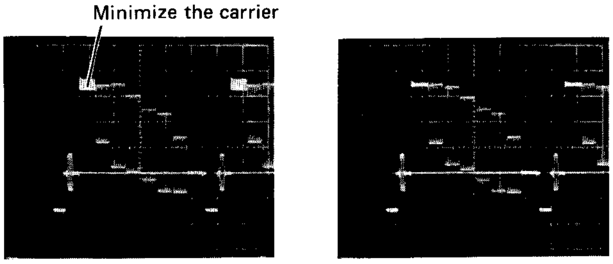
- Connect the oscilloscope to the terminated VIDEO OUT and trigger the oscilloscope at H rate (Use TP17, Mother board), or observe the waveform monitor.
- Adjust V CARRIER BALANCE VR6 and U CARRIER BALANCE VR7 alternately so that the carrier on the black level of video signal becomes minimum. (Fig. 4-4-4)



NO GOOD GOOD

Fig. 4-4-4

- Adjust V WHITE BALANCE VR2 and O WHITE BALANCE VR4 alternately so that the carrier on the white level of video signal becomes minimum. (Fig. 4-4-5)



NO GOOD GOOD

Fig. 4-4-5

- Repeat adjusting VR6, VR7, VR2 and VR4 so that the carrier on the black and white level of video signal is minimum.

(c) Pedestal, Y gain and sync level adjustment

Test point :	VIDEO OUT	
Adjusts :	VR10 (Y GAIN)	Encoder board
	VR11 (SYNC LEVEL)	〃 〃
	VR13 (BAR PEDESTAL)	〃 〃
Observe :	Waveform monitor	

- Observe the waveform monitor or connect the oscilloscope to the terminated VIDEO OUT and trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust BAR PEDESTAL VR13 so that the pedestal level of color bar signal is 0V. (Fig. 4-4-6)
- Adjust Y GAIN VR10 so that the Y signal level of color bar signal is 0.7 Vp-p. (Fig. 4-4-6)
- Adjust SYNC LEVEL VR11 so that the sync level is 0.3 Vp-p. (Fig. 4-4-6)

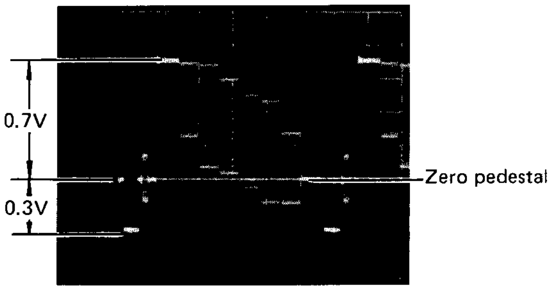


Fig. 4-4-6

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

(d) Chroma and burst adjustment

Test point :	VIDEO OUT	
Adjusts :	VR3 (BURST LEVEL)	Encoder board
	VR5 (U GAIN)	〃 〃
	VR8 (CHROMA GAIN)	〃 〃
	VR9 (SC QUAD)	〃 〃
	VR12 (BURST PHASE)	〃 〃
Observe :	Vectorscope	

- Observe the vectorscope.
- Set the gain switch of the vectorscope to 75%.
- Turn the gain control of vectorscope to increase the burst vector for better viewing.
- Turn the phase control of vectorscope so that the burst vector for even field aligns with the U axis of the vectorscope. (Fig. 4-4-7)

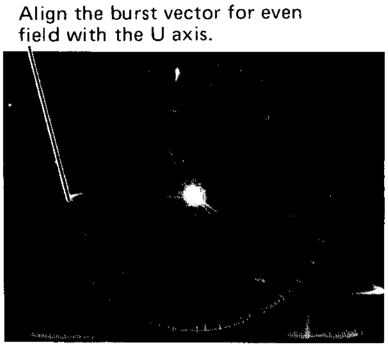
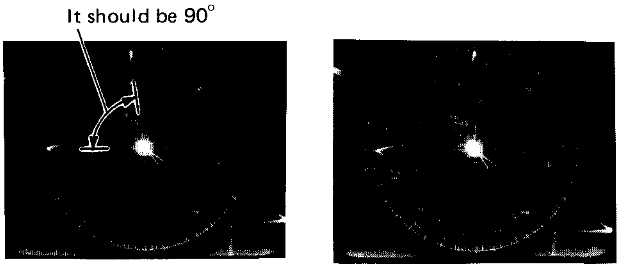


Fig. 4-4-7

- Adjust BURST PHASE VR12 so that the phase difference between the burst vectors for odd and even fields is 90°. (Fig. 4-4-8)



NO GOOD GOOD

Fig. 4-4-8

- Adjust SC QUAD VR9 so that the amplitude of the burst vector for odd and even field is same. (Fig. 4-4-9) Use the gain control of vectorscope for confirming the amplitude.

Make the burst levels same

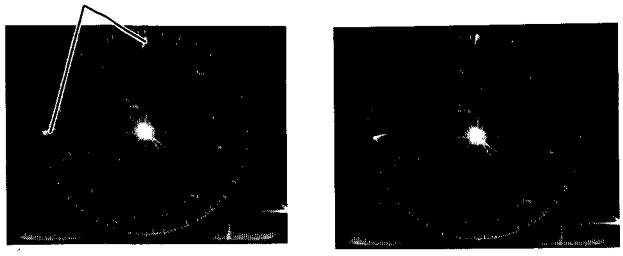

NO GOOD GOOD

Fig. 4-4-9

- Set the gain control of vectorscope to the calibration position.
- Turn the phase control of vectorscope so that the burst vectors positions on the burst axes on the vectorscope. (Fig. 4-4-10)

Burst vectors

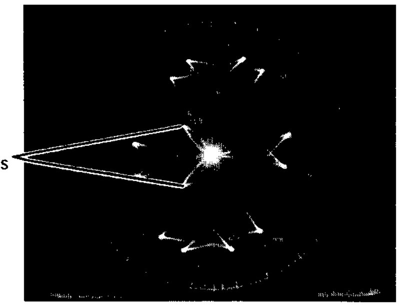


Fig. 4-4-10

- While paying attention on the red and green vectors, adjust CHROMA GAIN VR8 so that the red and green vectors fall into their respective boxes on the vectorscope. (Fig. 4-4-11)

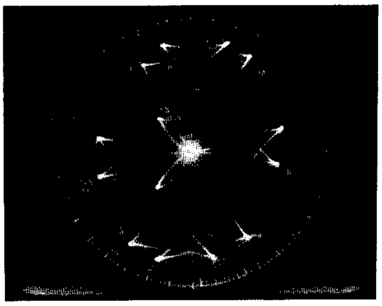


Fig. 4-4-11

- Adjust U GAIN VR5 so that the yellow and blue vectors fall into their respective boxes on the vectorscope. (Fig. 4-4-12)

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

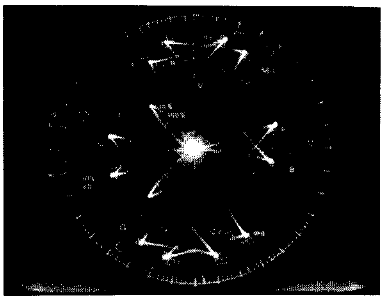


Fig. 4-4-12

- Repeat adjusting VR9, VR8 and VR5 so that all vectors fall into their respective boxes on the oscilloscope.
- Adjust BURST LEVEL VR3 so that the burst vectors position at 75% on the burst axes. (Fig. 4-4-13)

Burst vectors

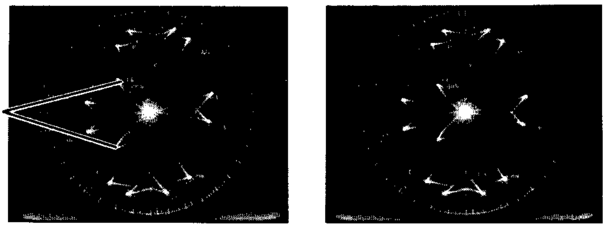

NO GOOD GOOD

Fig. 4-4-13

(e) –G gain adjustment

Test point :	TP6	Encoder board
Adjust :	VR14 (–G GAIN)	〃 〃

- Set the Color Bar/Camera Selection Switch to the CAMERA position.
- Set the switches on the Switch board of Deflection board as follows. (Fig. 4-4-14)

Monitoring Signal Selection Switch	REG
Registration Switch	G
–G ON/OFF Switch	OFF
Detail ON/OFF Switch	OFF

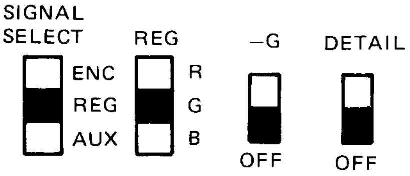
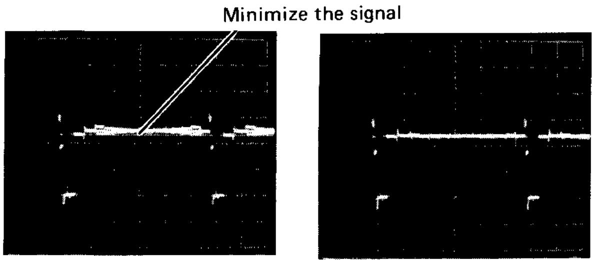


Fig. 4-4-14

- Connect the oscilloscope to TP6.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Set the –G ON/OFF Switch to the ON position.
- Adjust -G GAIN VR14 so that the video signal level is zero. (Fig. 4-4-15)



NO GOOD GOOD

Fig. 4-4-15

4-5 Deflection and High Voltage Board Adjustment

- Refer to the separate booklet for the test points and adjusting controls.

(a) Control panel removal

- Remove one screw fixing the control panel on the Deflection board and remove the panel. (Fig. 4-5-1)

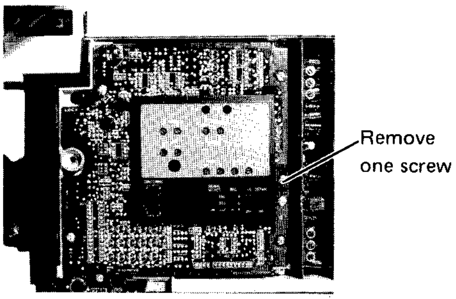


Fig. 4-5-1

(b) Target voltage adjustment

Test point:	Pin 5 of CN16	Mother board
Adjust :	VR11(TARGET)	High voltage board

- Connect the digital voltmeter (DVM) probe between pin 5 of CN16 on the Mother board and ground.
- Adjust TARGET VR11 for +50V.

(c) Focus adjustment

Test points :	TP1 (B)	Process-2 board
	TP2 (R)	" "
	TP3 (G)	" "
Adjusts :	VR4 (B FOCUS)	High voltage board
	VR5 (G FOCUS)	" " "
	VR6 (R FOCUS)	" " "
	Backfocus adjusting screws	
Observe :	Monochrome underscanned video monitor	

- Set the flangeback adjusting ring on the lens to the standard position after loosening the flangeback lock knob. (Fig. 4-5-2)

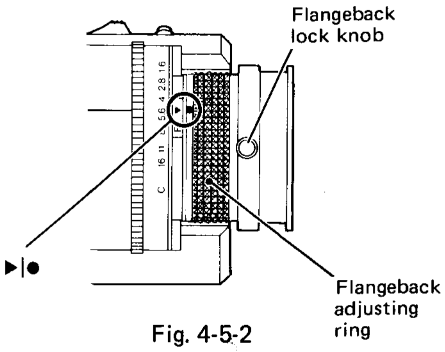


Fig. 4-5-2

- Set V OVERSCAN SWITCH SW1 and H OVERSCAN SWITCH SW2 on the Deflection board to the NORMAL (LOWER) position.
- Connect the PIX OUT connector on the rear of camera to the monochrome underscanned video monitor.

■ G focus adjustment

- Set the switches on the Switch board of Deflection board as shown below to observe the green (G) picture on the monochrome video monitor. (Fig. 4-5-3)

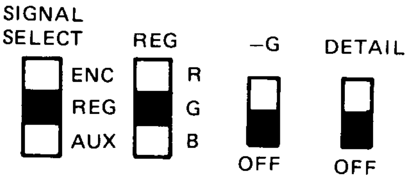


Fig. 4-5-3

- Loosen the G coil lock screw (G LOCK) slightly. (Fig. 4-5-4)

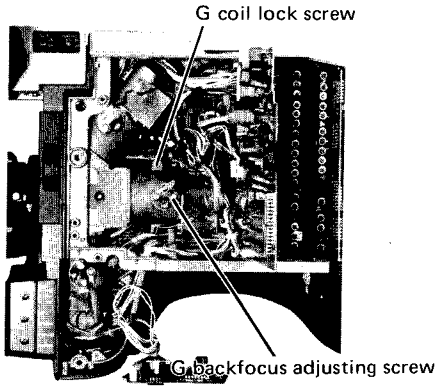


Fig. 4-5-4

- Set the lens iris to F1.6 in order to have minimum depth of focus. If the picture on the monochrome video monitor is saturated, set the filter wheel on the side of camera to the position 2.
- Aim the camera at the resolution chart or in-mega chart further than 2m from the camera.
- Zoom in (close up) and adjust the lens focus while observing the monochrome underscanned video monitor.
- Zoom out (wide angle) and adjust the focus by turning the G backfocus adjusting screw (G BACKFOCUS) (Fig. 4-5-4).
- Zoom in again and adjust the lens focus. (Adjust G FOCUS VR5 on the High voltage board if the electrical focus is excessively out of focus.)
- Zoom out again and adjust the focus by turning the G backfocus adjusting screw.
- Repeat this procedure until the focus tracks throughout the zoom range.
- Reset the lens iris to F4 and the filter wheel to the position 1.
- Aim the camera at the resolution or in-mega chart so that the chart will fully occupies the screen of monitor.
- Connect the oscilloscope to TP3 on the Process-2 board.
- Trigger the oscilloscope at H rate. (Use TP17, Mother board)
- Adjust G FOCUS VR5 to obtain best focus at the center of picture. When the in-mega chart is used for the focus adjustment, the modulation depth at the center of in-mega signal becomes maximum at the best focus. (Fig. 4-5-5)

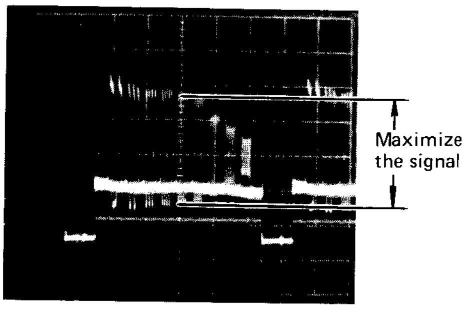


Fig. 4-5-5

- Tighten the G coil lock screw (G LOCK) and make sure that the focus remains properly adjusted.

■ R focus adjustment

- Set the filter wheel on the side of camera to the position 2 and the lens iris to F1.6 in order to have minimum depth of focus.
- Keep setting the switches on the Switch board of Deflection board as in the case of G focus adjustment to observe the green picture. (Fig. 4-5-3)
- Aim the camera at the resolution chart or in-mega chart.
- Zoom in (close up) and adjust the lens focus while observing the monochrome underscanned video monitor.
- Set the REGISTRATION SWITCH SW2 to the R position for observing the red (R) picture.
- Loosen the R coil lock screw (R LOCK) slightly. (Fig. 4-5-6)

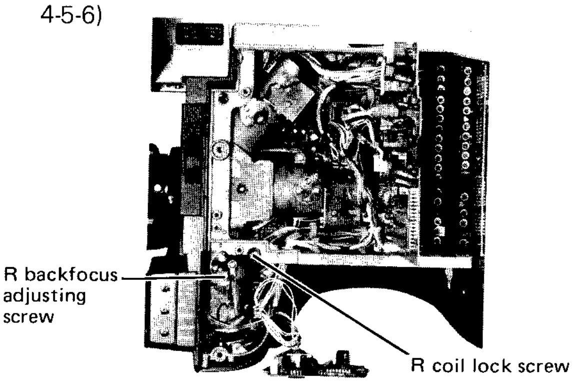


Fig. 4-5-6

- Adjust the focus by turning the R backfocus adjusting screw (R BACKFOCUS) (Fig. 4-5-6).
  Note : Do not adjust the lens focus when adjusting the R backfocus.
- Reset the filter wheel to the position 1 and the lens iris to F4.
- Connect the oscilloscope to TP2 on the Process-2 board.
- Trigger the oscilloscope at H rate. (Use TP17, Mother board.)
- Adjust R FOCUS VR6 to obtain best focus at the center of picture. When the in-mega chart is used for the focus adjustment, the modulation depth at the center of in-mega signal becomes maximum at the best focus. (Fig. 4-5-5)
- Repeat adjusting the R backfocus adjusting screw and R FOCUS VR6 to obtain best focus.
- Tighten the R coil lock screw (R LOCK) and make sure that the focus remains properly adjusted.

■ B focus adjustment

- Set the filter wheel on the side of camera to the position 2 and the lens iris to F1.6 in order to have minimum depth of focus.
- Set the switches on the Switch board of Deflection board as in the G focus adjustment to observe the green picture. (Fig. 4-5-3)
- Aim the camera at the resolution chart or in-mega chart.
- Zoom in (close up) and adjust the lens focus while observing the monochrome underscanned video monitor.
- Set the REGISTRATION SWITCH SW2 to the B position for observing the blue (B) picture.
- Loosen the B coil lock screw (B LOCK) slightly. (Fig. 4-5-7)

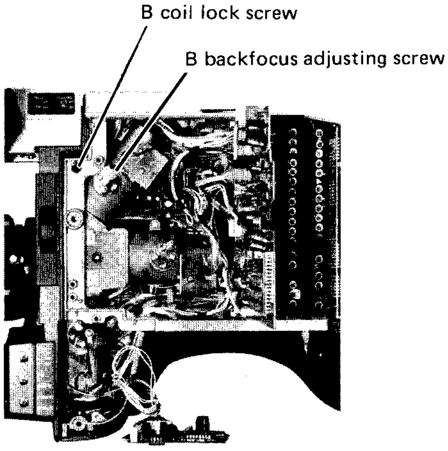


Fig. 4-5-7

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

- Adjust the focus by turning the B backfocus adjusting screw (B BACKFOCUS). (Fig. 4-5-7)
  Note : Do not adjust the lens focus when adjusting the B backfocus.
- Reset the filter wheel to the position 1 and the lens iris to F4.
- Connect the oscilloscope to TP1 on the Process-2 board.
- Trigger the oscilloscope at H rate. (Use TP17, Mother board.)
- Adjust B FOCUS VR4 to obtain best focus at the center of picture. When the in-mega chart is used for the focus adjustment, the modulation depth at the center of in-mega signal becomes maximum at the best focus. (Fig. 4-5-5)
- Repeat adjusting the backfocus adjusting screw and B FOCUS VR4 to obtain best focus.
- Tighten the B coil lock screw (B LOCK) and make sure that the focus remains properly adjusted.

(d) Horizontal and vertical size adjustment

Adjusts :	VR7 (TOTAL H-SIZE)	Deflection board
	L2 (G H-SIZE)	" "
	L3 (R H-SIZE)	" "
	L4 (B H-SIZE)	" "
	VR19 (TOTAL V-SIZE)	" "
	VR20 (R V-SIZE)	" "
	VR21 (B V-SIZE)	" "
	VR23 (G H-CENTERING)	" "
	VR22 (G V-CENTERING)	" "
	VR42 (R H-CENTERING)	" "
	VR40 (R V-CENTERING)	" "
	VR41 (B H-CENTERING)	" "
	VR39 (B V-CENTERING)	" "
Observe :	Monochrome underscanned video monitor	

- Set the switches on the Switch board of Deflection board as shown below in order to observe the green (G) picture on the monochrome underscanned video monitor. (Fig. 4-5-8)

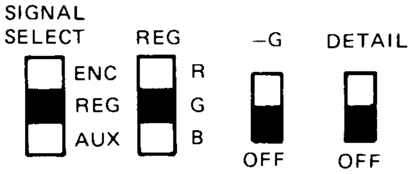


Fig. 4-5-8

- Set the V OVERSCAN SWITCH SW1 and the H OVERSCAN SWITCH SW2 on the Deflection board to the OVERSCAN (upper) position.
- Adjust G H-CENTERING VR23 and G V-CENTERING VR22 so that the target ring (edge) of G pick-up tube is observed equally at the four corners of underscanned monitor. (Fig. 4-5-9)
  Note : If the target ring (edge) of G pick-up tube can not be observed, adjust TOTAL H-SIZE VR7 and TOTAL V-SIZE VR19.

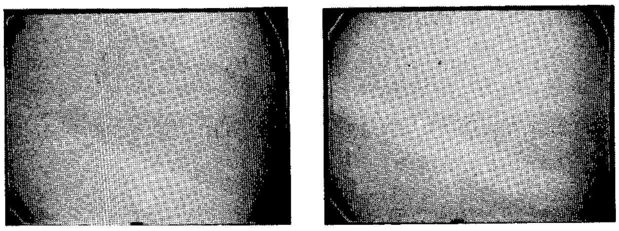

NO GOOD GOOD

Fig. 4-5-9

- Aim the camera at the registration chart and adjust the zoom lens so that the a diagonal of chart is 85% of pick-up tube diameter. (Fig. 4-5-10)

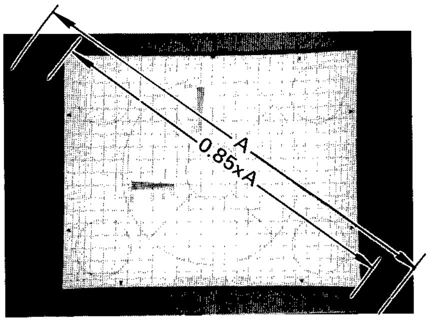


Fig. 4-5-10

- Reset the V OVERSCAN SWITCH SW1 and the H OVERSCAN SWITCH SW2 to the NORMAL (lower) position.
- Adjust TOTAL H-SIZE VR7 and TOTAL V-SIZE VR19 so that the reference arrow heads in the registration chart line up with the edge of the raster on the monochrome underscanned video monitor. (Fig. 4-5-11)

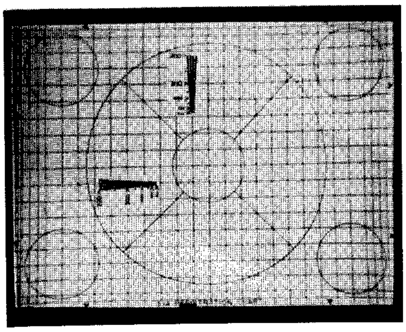


Fig. 4-5-11

- Set the REGISTRATION SWITCH SW2 to the R position and −G ON/OFF SWITCH SW3 to the ON position (Fig. 4-5-12) in order to observe the R-G picture.

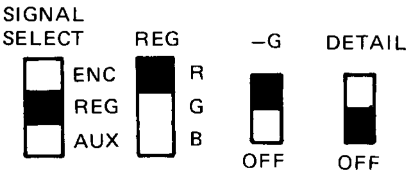


Fig. 4-5-12

- Adjust R H-CENTERING VR42, R V-CENTERING VR40, R H-SIZE L3 and R V-SIZE VR20 repeatedly so that the red (black line) and green (white line) pictures roughly coincide with each other over the entire raster. (Fig. 4-5-13)

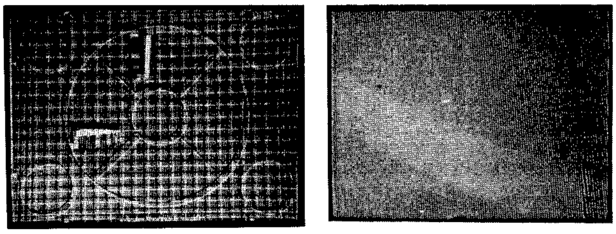

NO GOOD GOOD

Fig. 4-5-13

- Set the REGISTRATION SWITCH SW2 to the B position in order to observe the B-G picture.
- Adjust B H-CENTERING VR41, B V-CENTERING VR39, B H-SIZE L4 and B V-SIZE VR21 repeatedly so that the blue (black line) and green (white line) pictures roughly coincide with each other over the entire raster. (Fig. 4-5-13)

(e) Beam current adjustment

Test points :	TP1 (G)	Process-1 board
	TP3 (R)	〃 〃
	TP6 (B)	〃 〃
Adjusts :	VR1 (R BEAM)	High voltage board
	VR2 (G BEAM)	〃
	VR3 (B BEAM)	〃
	VR7 (R FBC LEVEL)	〃
	VR8 (G FBC LEVEL)	〃
	VR9 (B FBC LEVEL)	〃

- **Turn R FBC LEVEL VR7, G FBC LEVEL VR8 and B FBC LEVEL VR9 on the High voltage board fully counterclockwise to minimize the feedback level. These controls will be adjusted after completing (I) White clip adjustment on page 33.**
- Aim the camera at the gray scale chart which is illuminated with 2000 lux and set the lens iris to F2.8.
- Connect the oscilloscope to TP1 on the Process-1 board.
- Trigger the oscilloscope at H rate. (Use TP17, Mother board.)
- Turn G BEAM VR2 fully counterclockwise first. Then turn it back slowly and stop at a point where the white chip (top step) of gray scale waveform just appears completely. (Fig. 4-5-14)

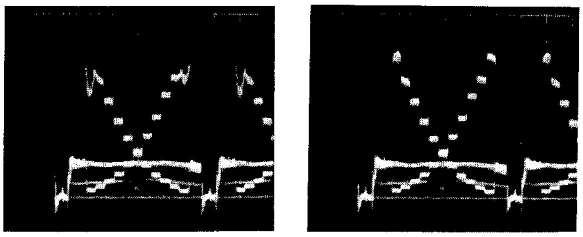

NO GOOD GOOD

Fig. 4-5-14

- Connect the oscilloscope to TP3 on the Process-1 board.
- Turn R BEAM VR1 fully counterclockwise first. Then turn it back slowly and stop at a point where the white chip (top step) of gray scale waveform just appears completely as in the case of G beam adjustment. (Fig. 4-5-14)
- Connect the oscilloscope to TP6 on the Process-1 board.
- Turn B BEAM VR3 fully counterclockwise first. Then turn it back slowly and stop at a point where the white chip (top step) of gray scale waveform just appears completely as in the case of G and R beam adjustment. (Fig. 4-5-14)

(f) Beam alignment adjustment

- Prepare a low-frequency sine wave oscillator hooking a 0.47μF/600V capacitor in series with its output.
- Set the frequency in the range of 10 to 30Hz.
- Adjust the signal level when necessary while watching the monitor.
- Remove the isolation paper for the High voltage board. (Fig. 4-5-15)

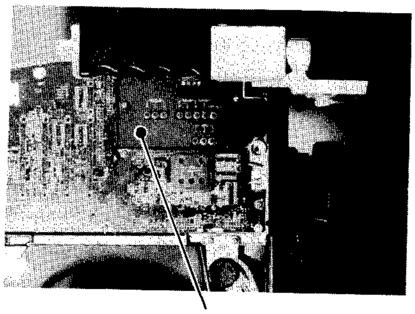


Fig. 4-5-15

- Set the lens iris to F4, and aim the camera at the registration chart.

■ G beam alignment adjustment

Test point :	TP2 (G FOCUS)	High voltage board
Adjusts :	VR3 (G V-ALIGNMENT)	Deflection board
	VR4 (G H-ALIGNMENT) "	"
Observe :	Monochrome underscanned video monitor	

- Set the switches on the Switch board of Deflection board as shown below in order to observe the green (G) picture on the monochrome underscanned video monitor. (Fig. 4-5-16)

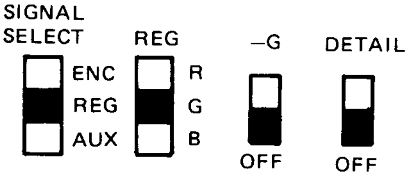


Fig. 4-5-16

- Feed the oscillator's output through the 0.47μF capacitor to TP2 on the High voltage board. The registration chart on the monitor will move horizontally, vertically or diagonally.
- Adjust G V-ALIGNMENT VR3 so that the registration chart will not move in the vertical direction.
- Then adjust G H-ALIGNMENT VR4 so that the registration chart will not move in the horizontal direction.
- Repeat adjusting VR3 and VR4 so that the movement of registration chart, especially at the center, on the monitor is minimum. (Fig. 4-5-17)

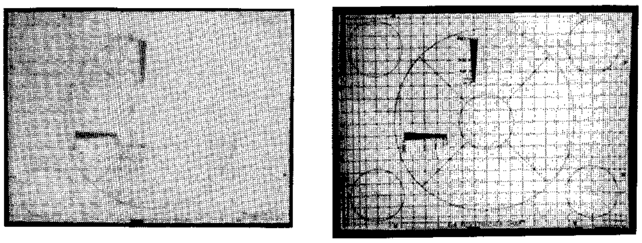

NO GOOD GOOD

Fig. 4-5-17

■ R beam alignment adjustment

Test point:	TP3 (R FOCUS)	High voltage board
Adjusts :	VR1 (R V-ALIGNMENT)	Deflection board
	VR2 (R H-ALIGNMENT)	" "
Observe :	Monochrome underscanned video monitor	

- Set the REGISTRATION SWITCH SW2 to the R position in order to observe the red (R) picture on the monochrome underscanned video monitor.
- Feed the oscillator's output through 0.47μF capacitor to TP3 on the High voltage board.
- Adjust R V-ALIGNMENT VR1 and R H-ALIGNMENT VR2 repeatedly so that the movement at the center of registration chart on the monitor is minimum as in the case of the G beam alignment adjustment. (Fig. 4-5-17)

■ B beam alignment adjustment

Test point :	TP1 (B FOCUS)	High voltage board
Adjusts :	VR5 (B V-ALIGNMENT)	Deflection board
	VR6 (B H-ALIGNMENT)	" "
Observe :	Monochrome underscanned video monitor	

- Set the REGISTRATION SWITCH SW2 to the B position in order to observe the blue (B) picture on the monochrome underscanned video monitor.
- Feed the oscillator's output through 0.47μF capacitor to TP1 on the High voltage board.
- Adjust B V-ALIGNMENT VR5 and B H-ALIGNMENT VR6 repeatedly so that the movement at the center of registration chart on the monitor is minimum as in the case of the G and R beam alignment adjustment. (Fig. 4-5-17)
- When a low-frequency oscillator is not available, turn the focus control (VR5 for the G channel, VR6 for the R channel, VR4 for the B channel) on the High voltage board back and forth quickly and adjust by the picture in the same manner as described in the preceding alignment adjustment section. After adjustment, the focus controls VR4 - VR6 should be readjusted while referring to (c) Focus adjustment on page 15. (This method is a rough adjustment. It is preferable to use a low-frequency oscillator method.)

(g) Centering adjustment

Adjusts :	VR23 (G H-CENTERING)	Deflection board
	VR22 (G V-CENTERING)	" "
	VR42 (R H-CENTERING)	" "
	VR40 (R V-CENTERING)	" "
	VR41 (B H-CENTERING)	" "
	VR39 (B V-CENTERING)	" "
Observe :	Monochrome underscanned video monitor	

- Set the switches on the Switch board of Deflection board as shown below in order to observe the green (G) picture on the monochrome underscanned video monitor. (Fig. 4-5-18)

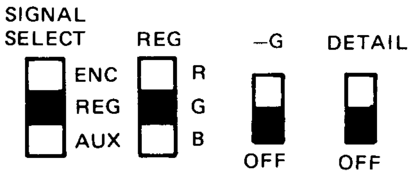


Fig. 4-5-18

- Aim the camera at the registration chart and set the lens iris to F4.
- Set the V OVERSCAN SWITCH SW1 and the H OVERSCAN SWITCH SW2 on the Deflection board to the OVERSCAN (upper) position.
- Adjust G H-CENTERING VR23 and G V-CENTERING VR22 so that the target ring (edge) of G pick-up tube is equally observed at the four corners of underscanned video monitor. (Fig. 4-5-19)

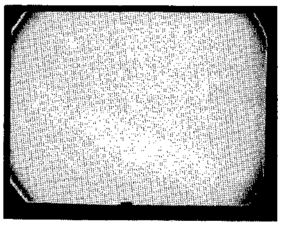


Fig. 4-5-19

- Reset the V OVERSCAN SWITCH SW1 and the H OVERSCAN SWITCH SW2 to the NORMAL (lower) position.
- Set the REGISTRATION SWITCH SW2 to the R position and –G ON/OFF SWITCH SW3 to the ON position in order to observe the R-G picture. (Fig. 4-5-20)

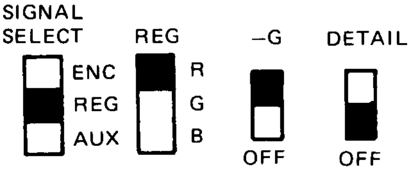
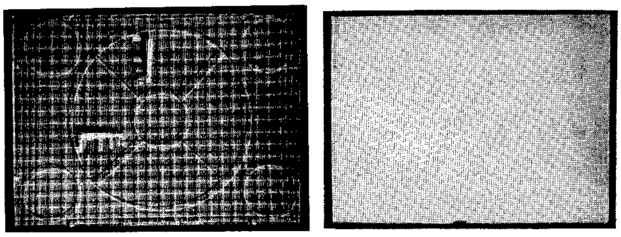


Fig. 4-5-20

- Adjust R H-CENTERING VR42, R V-CENTERING VR40 so that the red (black line) and green (white line) pictures roughly coincide with each other over the entire raster. (Fig. 4-5-21)



NO GOOD GOOD

Fig. 4-5-21

- Set the REGISTRATION SWITCH SW2 to the B position in order to observe the B-G picture.
- Adjust B H-CENTERING VR41, B V-CENTERING VR39 so that the blue (black line) and green (white line) pictures roughly coincide with each other over the entire raster.

(h) G deflection coil rotation adjustment

Adjust :	G coil rotation screw
Observe :	Monochrome underscanned video monitor

- Aim the camera at the linearity chart and set the lens iris to F4.
- Set the switches on the Switch board of Deflection board as shown below to observe the green (G) picture. (Fig. 4-5-22)

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

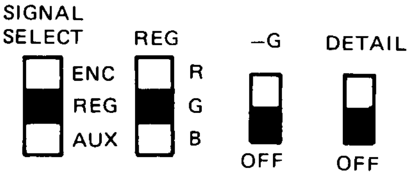


Fig. 4-5-22

- Make sure that the camera is level with the chart.
- Connect the PIX OUT connector and the video output connector of crosshatch generator to the monochrome underscanned video monitor at the same time. Supply the composite sync signal or video signal to the GEN-LOCK connector on the rear of camera from the crosshatch generator. (Fig. 4-5-23)

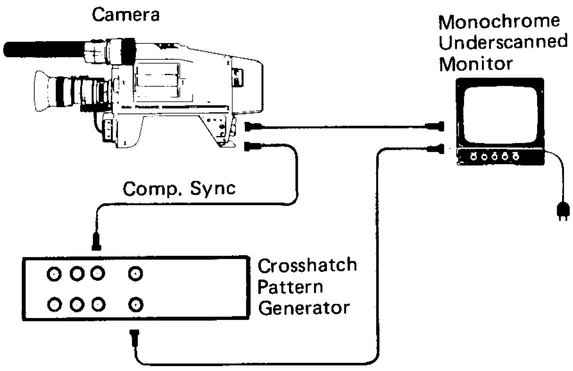


Fig. 4-5-23

- Confirm that the horizontal line of crosshatch pattern is parallel with balls on the linearity chart. (Fig. 4-5-24)

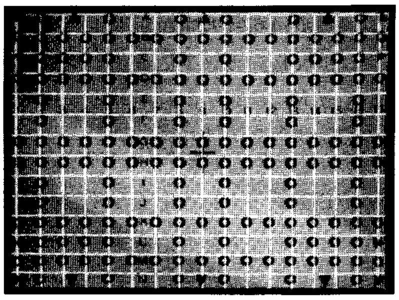


Fig. 4-5-24

- If not, loosen the G coil lock screw (G LOCK) slightly and turn the G coil rotation screw (G ROTATION) slowly and carefully (Fig. 4-5-25) so that the balls in horizontal direction on the linearity chart is parallel with the horizontal line of crosshatch pattern. (Fig. 4-5-26)

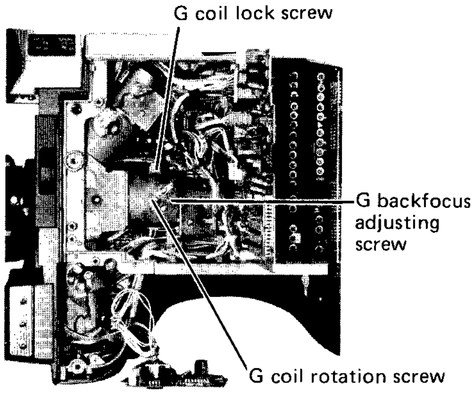


Fig. 4-5-25

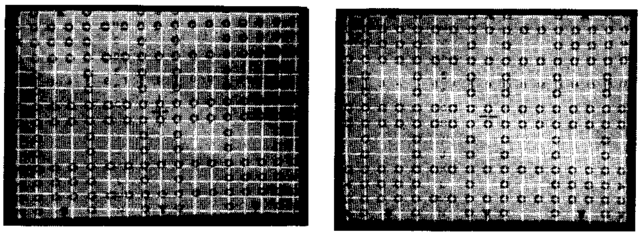

NO GOOD GOOD

Fig. 4-5-26

- Confirm that the G backfocus remains properly adjusted. If not, readjust the G backfocus screw (G BACKFOCUS) (Fig. 4-5-25) to obtain the best focus. Refer to the G focus adjustment on page 16.
- Tighten the G coil lock screw (G LOCK).
- Keep connecting the PIX OUT connector and the video output connector of crosshatch generator to the monochrome underscanned monitor and supplying the composite sync signal or video signal to the GEN-LOCK connector on the rear of camera from the crosshatch generator for the next step.

(i) Linearity adjustment

Adjusts :	**VR9 (G H-LIN1)**	**Deflection board**
	VR8 (G H-LIN2)	**" "**
	VR14 (TOTAL V-LIN)	**" "**
Observe :	**Monochrome underscanned video monitor**	

- Keep the PIX OUT connector and the video output connector of crosshatch generator connected and the composite sync signal or video signal supplied as in the preceding step.

  Note : Aspect ratio of crosshatch generator should be set to 4:3.

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

- Keep the switches on the Switch board set as in the preceding step to observe the green (G) picture.
- Aim the camera at the linearity chart and set the lens iris to F4.
- Line up the reference allow heads with edges of the raster on the underscanned monitor. (Fig. 4-5-27)

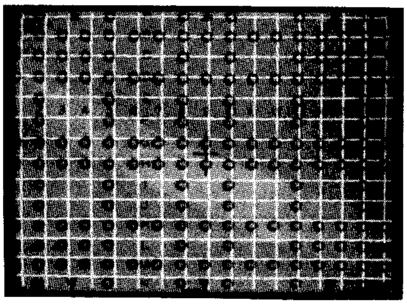


Fig. 4-5-27

- Confirm that the center of linearity chart is aligned with the center of crosshatch pattern. If needed, adjust vertical and horizontal position of crosshatch pattern on the generator. (Fig. 4-5-28)

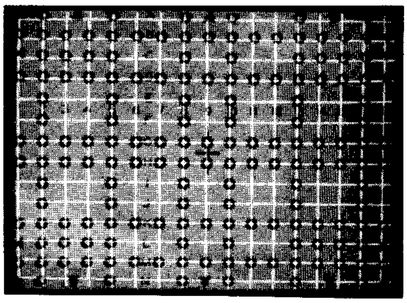


Fig. 4-5-28

- Adjust G H-LIN1 VR9, G H-LIN2 VR8 and TOTAL V-LIN VR14 so that each center (white) portion of ball on the linearity chart aligns with each cross point of the crosshatch pattern. (Fig. 4-5-29)

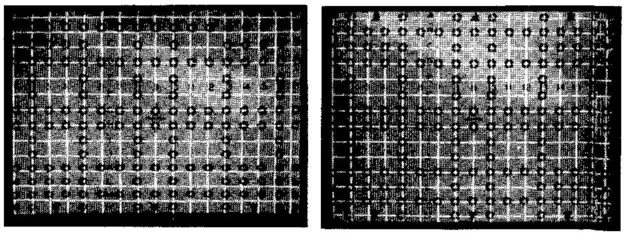

NO GOOD GOOD

Fig. 4-5-29

- Disconnect the video output connector of crosshatch generator from the monochrome underscanned monitor and the composite sync or video signal from the GEN-LOCK connector.

(j) Red registration adjustment

Adjusts :	R coil rotation screw	
	L3 (R H-SIZE)	Deflection board
	VR11 (R H-LIN1)	" "
	VR10 (R H-LIN2)	" "
	VR20 (R V-SIZE)	" "
	VR17 (R V-LIN)	" "
	VR16 (R SKEW)	" "
	VR42 (R H-CENTERING)	" "
	VR40 (R V-CENTERING)	" "
Observe :	Monochrome underscanned video monitor	

- Set the switches on the Switch board of Deflection board as shown below in order to observe the R-G picture on the monochrome underscanned monitor. (Fig. 4-5-30)

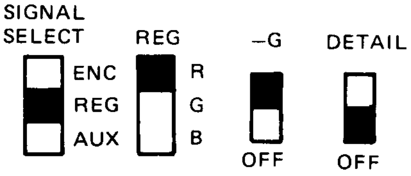


Fig. 4-5-30

- Aim the camera at the registration chart and set the lens iris to F4.

■ **R deflection coil rotation adjustment**

- Loosen the R coil lock screw (R LOCK) slightly and turn the R coil rotation screw (R ROTATION) slowly and carefully (Fig. 4-5-31) so that the R horizontal (black) lines of registration chart are parallel with the G horizontal (white) lines. (Fig. 4-5-32) The parallel can be confirmed by turning R V-CENTERING VR40.

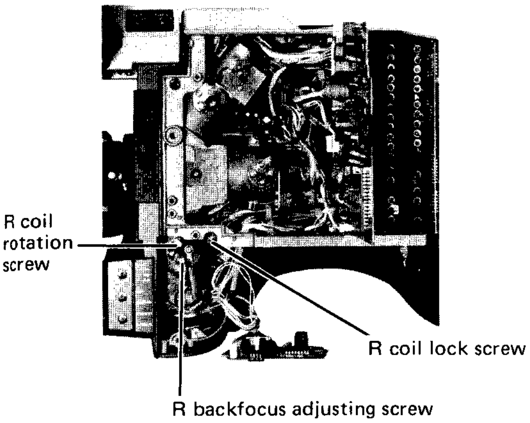
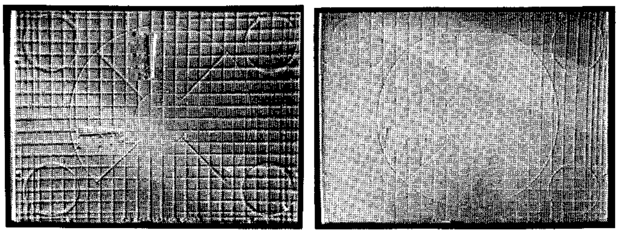


Fig. 4-5-31



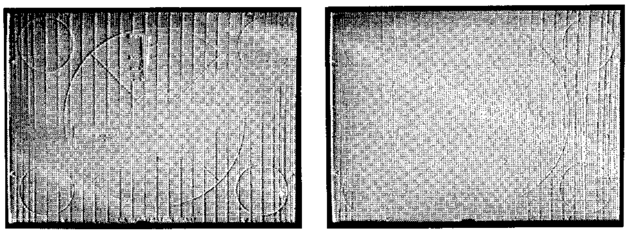
NO GOOD GOOD

Fig. 4-5-32

- Confirm that the R backfocus remains properly adjusted. If not, readjust the R backfocus screw while referring to ■ R focus adjustment on page 16.
- Tighten the R coil lock screw (R LOCK) after confirming the R deflection coil rotation and R backfocus.

■ **R skew adjustment**

- Adjust R SKEW VR16 so that the R vertical (black) lines of registration chart are parallel with the G vertical (white) lines. (Fig. 4-5-33) The parallel can be confirmed by turning R H-CENTERING VR42.



NO GOOD GOOD

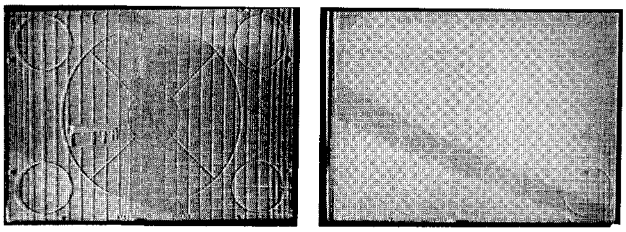
Fig. 4-5-33

■ **R horizontal registration adjustment**

- Adjust R V-CENTERING VR40 so that the center horizontal lines of the registration chart for the R and G pictures coincide.
- Adjust R H-CENTERING VR42, R H-SIZE L3, R H-LIN1 VR11 and R H-LIN2 VR10 repeatedly so that the R vertical lines in the center portion of registration chart coincide with the G vertical lines. (Fig. 4-5-34)

  R H-LIN2 VR10 is mainly used for adjusting the overall horizontal linearity and R H-LIN1 VR11 for the left side horizontal linearity.

  Note : When the R and G lines coincide, the contrast of line is minimum.

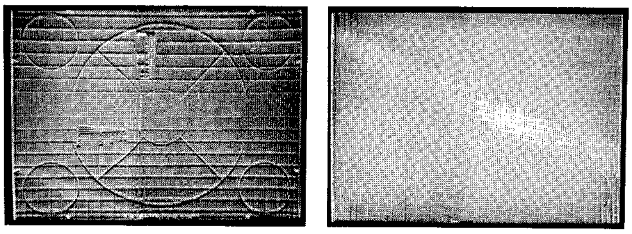


NO GOOD GOOD

Fig. 4-5-34

■ R vertical registration adjustment

- Adjust R V-CENTERING VR40, R V-SIZE VR20 and R V-LIN VR17 repeatedly so that the R horizontal lines of registration chart coincide with the G horizontal lines. (Fig. 4-5-35)



NO GOOD GOOD

Fig. 4-5-35

■ R registration fine-adjustment

- Check that the R and G lines of the registration chart coincide over the entire raster on the monochrome underscanned video monitor.
  If needed, fine-adjust R H-CENTERING VR42, R V-CENTERING VR40, R SKEW VR16, R H-SIZE L3, R H-LIN1 VR11, R H-LIN2 VR10, R V-SIZE VR20 and R V-LIN VR17 carefully so that the R and G lines coincide.

(k) Blue registration adjustment

Adjusts :	B coil rotation screw	
	L4 (B H-SIZE)	Deflection board
	VR13 (B H-LIN1)	〃 〃
	VR12 (B H-LIN2)	〃 〃
	VR21 (B V-SIZE)	〃 〃
	VR18 (B V-LIN)	〃 〃
	VR15 (B SKEW)	〃 〃
	VR41 (B H-CENTERING)	〃 〃
	VR39 (B V-CENTERING)	〃 〃
Observe :	Monochrome underscanned video monitor	

- Set the switches on the Switch board of Deflection board as shown below in order to observe the B-G picture on the monochrome underscanned monitor. (Fig. 4-5-36)

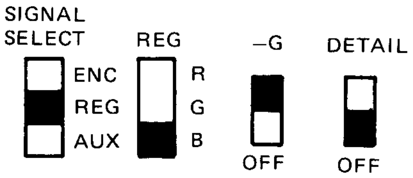


Fig. 4-5-36

- Aim the camera at the registration chart and set the lens iris to F4.
- Adjust the blue registration as in the case of red registration adjustment.

■ B deflection coil rotation adjustment

- Loosen the B coil lock screw (B LOCK) slightly and turn the B coil rotation screw (B ROTATION) slowly and carefully (Fig. 4-5-37) so that the B horizontal (black) lines of registration chart are parallel with the G horizontal (white) lines. (Fig. 4-5-32) The parallel can be confirmed by turning B V-CENTERING VR39.

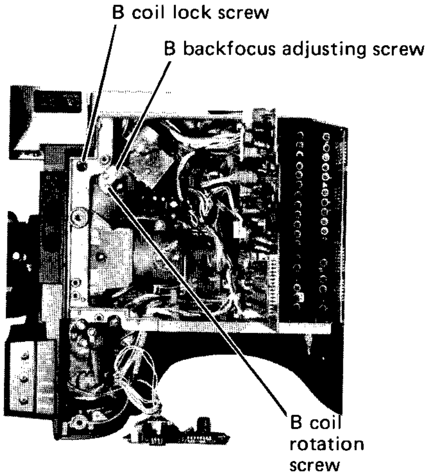


Fig. 4-5-37

- Confirm that the B backfocus remains properly adjusted. If not, readjust the B backfocus screw while referring to ■ B focus adjustment on page 17.
- Tighten the B coil lock screw (B LOCK) after confirming the B deflection coil rotation and B backfocus.

■ B skew adjustment

- Adjust B SKEW VR15 so that the B vertical (black) lines of registration chart are parallel with the G vertical (white) lines. (Fig. 4-5-33) The parallel can be confirmed by turning B H-CENTERING VR41.

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

■ **B horizontal registration adjustment**

- Adjust B V-CENTERING VR39 so that the center horizontal lines of the registration chart for the B and G pictures coincide.
- Adjust B H-CENTERING VR41, B H-SIZE L4, B H-LIN1 VR13 and B H-LIN2 VR12 repeatedly so that the B vertical lines in the center portion of registration chart coincide with the G vertical lines. (Fig. 4-5-34)

  B H-LIN2 VR12 is mainly used for adjusting the overall horizontal linearity and B H-LIN1 VR13 for the left side horizontal linearity.

  Note : When the B and G lines coincide, the contrast of line is minimum.

■ **B vertical registration adjustment**

- Adjust B V-CENTERING VR39, B V-SIZE VR21 and B V-LIN VR18 repeatedly so that the B horizontal lines of registration chart coincide with the G horizontal lines. (Fig. 4-5-35)

■ **B registration fine-adjustment**

- Check that the B and G lines of the registration chart coincide over the entire raster on the monochrome underscanned video monitor. If needed, fine-adjust B H-CENTERING VR41, B V-CENTERING VR39, B SKEW VR15, B H-SIZE L4, B H-LIN1 VR13, B H-LIN2 VR12, B V-SIZE VR21 and B V-LIN VR18 carefully so that the B and G lines coincide.

4-6 Preamplifier Board Adjustment

(a) Frequency response adjustment

Test points :	TP1 (G)	Process-1 board
	TP3 (R)	〃 〃
	TP6 (B)	〃 〃
Adjusts :	CT1 (FREQUENCY RESPONSE)	Preamp board

- Aim the camera at the in-mega cycle chart.
- Connect the oscilloscope to TP1 on the Process-1 board for the green signal.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Expand the 0.5MHz - cycle portion on the oscilloscope. (Fig. 4-6-1)

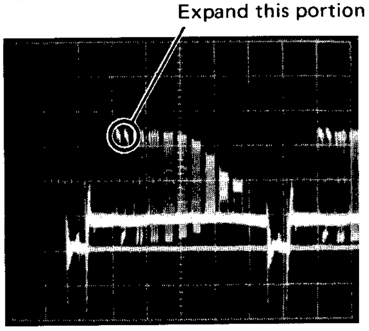


Fig. 4-6-1

- Adjust FREQUENCY RESPONSE CT1 on the Preamplifier board for the G channel (Fig. 4-6-2) to make the signal waveform as flat as possible. (Fig. 4-6-3)

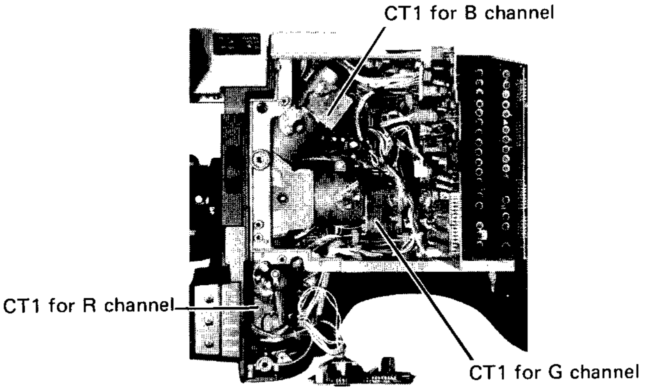
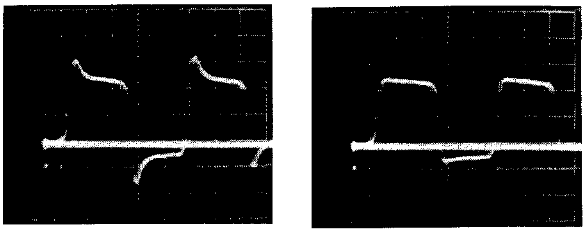


Fig. 4-6-2



NO GOOD GOOD

Fig. 4-6-3

- Connect the oscilloscope to TP3 on the Process-1 board for the red signal.
- Adjust FREQUENCY RESPONSE CT1 on the Preamplifier board for the R channel (Fig. 4-6-2) to make the signal waveform as flat as possible as in the case of G frequency response adjustment. (Fig. 4-6-3)
- Connect the oscilloscope to TP6 on the Process-1 board for the blue signal.
- Adjust FREQUENCY RESPONSE CT1 on the Preamplifier board for the B channel (Fig. 4-6-2) to make the signal waveform as flat as possible as in the case of G and R frequency response adjustment. (Fig. 4-6-3)

4-7 Mother Board Adjustment

- Refer to the separate booklet for the test points and adjusting controls.

(a) Gain and pedestal preset adjustment

Test points :	TP1 (R GAIN)	Mother board
	TP2 (B GAIN)	''
	TP3 (R PEDESTAL)	''
	TP4 (B PEDESTAL)	''
	TP5 (TOTAL PEDESTAL)	''
Adjusts :	VR1 (R GAIN)	''
	VR2 (B GAIN)	''
	VR3 (R PEDESTAL)	''
	VR4 (B PEDESTAL)	''
	VR5 (TOTAL PEDESTAL)	''
	VR6 (R GAIN PRESET)	''
	VR7 (B GAIN PRESET)	''
	VR8 (R PEDESTAL PRESET)	''
	VR9 (B PEDESTAL PRESET)	''
	VR10 (TOTAL PEDESTAL PRESET)	''

- Set the Auto/Manual Selection Switch on the front of camera to the MANUAL position.
- Set R GAIN VR1, B GAIN VR2, R PEDESTAL VR3, B PEDESTAL VR4 and TOTAL PEDESTAL VR5 to their mechanical center position.
- Connect the digital voltmeter (DVM) to TP1 and adjust R GAIN PRESET VR6 for +4.5V.
- Connect the DVM probe to TP2 and adjust B GAIN PRESET VR7 for +4.5V.
- Connect the DVM probe to TP3 and adjust R PEDESTAL PRESET VR8 for +3.0V.
- Connect the DVM probe to TP4 and adjust B PEDESTAL PRESET VR9 for +3.0V
- Connect the DVM probe to TP5 and adjust TOTAL PEDESTAL PRESET VR10 for +4.5V.

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

4-8 Process-1 and Process-2 Board Adjustment

- Refer to the separate booklet for the test points and adjusting controls.

(a) Input GAIN adjustment

Test points :	TP3 (G)	Process-2 board
	TP2 (R)	'' ''
	TP1 (B)	'' ''
Adjusts :	VR1 (G INPUT GAIN)	Process-1 board
	VR3 (R INPUT GAIN)	'' ''
	VR5 (B INPUT GAIN)	'' ''

- Aim the camera at the logarithmic gray scale chart and set the lens iris to F4.
- Set the High Gain Selection Switch to the 0 dB position.
- Connect the oscilloscope to TP3 on the Process-2 board and trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust G INPUT GAIN VR1 on the Process-1 board for 1.6V. (Fig. 4-8-1)

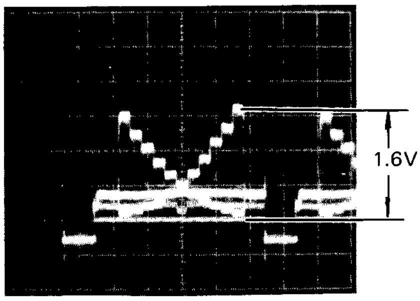


Fig. 4-8-1

- Connect the oscilloscope to TP2 on the Process-2 board and adjust R INPUT GAIN VR3 on the Process-1 board for 1.6V.
- Connect the oscilloscope to TP1 on the Process-2 board and adjust B INPUT GAIN VR5 on the Process-1 board for 1.6V.

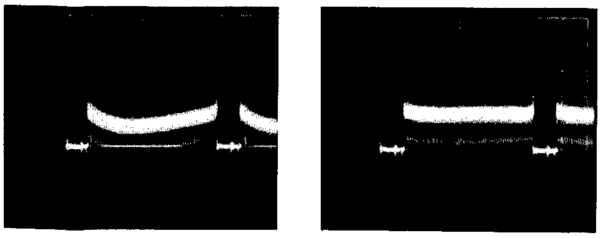
(b) Dark shading adjustment

Test points :	TP3 (G)	Process-2 board
	TP2 (R)	〃 〃
	TP1 (B)	〃 〃
Adjusts :	VR30 (G V-SAWTOOTH)	Deflection board
	VR31 (G V-PARABOLA)	〃 〃
	VR32 (G H-SAWTOOTH)	〃 〃
	VR33 (G H-PARABOLA)	〃 〃
	VR35 (R V-SAWTOOTH)	〃 〃
	VR36 (R V-PARABOLA)	〃 〃
	VR37 (R H-SAWTOOTH)	〃 〃
	VR38 (R H-PARABOLA)	〃 〃
	VR25 (B V-PARABOLA)	〃 〃
	VR26 (B V-PARABOLA)	〃 〃
	VR27 (B H-SAWTOOTH)	〃 〃
	VR28 (B H-PARABOLA)	〃 〃

- Close the lens or set the filter wheel to the position 4.
- Set the High Gain Selection Switch to the +12 dB position.

■ **G dark shading adjustment**

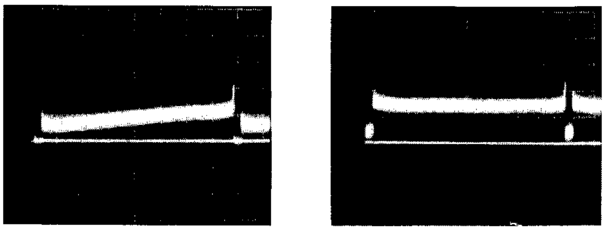
- Connect the oscilloscope to TP3 on the Process-2 board and trigger the oscilloscope at H rate (use TP17, Mother board).
- While observing the waveform adjust DARK SHADING, G H-SAWTOOTH VR32 and G H-PARABOLA VR33 on the Deflection board to make the dark waveform as flat as possible. (Fig. 4-8-2)



NO GOOD GOOD

Fig. 4-8-2

- After above adjustment, trigger the oscilloscope at V rate (Use TP19, Mother board).
- Adjust G V-SAWTOOTH VR30 and G V-PARABOLA VR31 to make the dark waveform as flat as possible. (Fig. 4-8-3)



NO GOOD GOOD

Fig. 4-8-3

- Adjust R and B dark shading in the same manner.

■ **R dark shading adjustment**

- Connect the oscilloscope to TP2 on the Process-2 board and trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust DARK SHADING, R H-SAWTOOTH VR37 and R H-PARABOLA VR38 on the Deflection board to make the dark waveform as flat as possible as in the case of G dark shading adjustment. (Fig. 4-8-2)
- Trigger the oscilloscope at V rate (Use TP19, Mother board).
- Adjust R V-SAWTOOTH VR35 and R V-PARABOLA VR36 to make the dark waveform as flat as possible. (Fig. 4-8-3)

■ **B dark shading adjustment**

- Connect the oscilloscope to TP1 on the Process-2 board and trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust DARK SHADING, B H-SAWTOOTH VR27 and B H-PARABOLA VR28 on the Deflection board to make the dark waveform as flat as possible as in the case of G dark shading adjustment. (Fig. 4-8-2)
- Trigger the oscilloscope at V rate (Use TP19, Mother board).
- Adjust B V-SAWTOOTH VR25 and B V-PARABOLA VR26 to make the dark waveform as flat as possible. (Fig. 4-8-3)

(c) Blanking offset adjustment

Test points :	TP3 (G)	Process-2 board
	TP2 (R)	〃 〃
	TP1 (B)	〃 〃
Adjusts :	VR29 (G BL OFFSET)	Deflection board
	VR34 (R BL OFFSET)	〃 〃
	VR24 (B BL OFFSET)	〃 〃

- This adjustment should be done after completing the preceding step.
- Confirm that the Deflection board is fixed to the main chassis with two screws.
- Close the lens or set the filter wheel to the position 4.

■ **G blanking offset adjustment**

- Connect the oscilloscope to TP3 on the process-2 board and trigger the oscilloscope at H rate (Use TP17, Mother board).
- Set the High Gain Selection Switch on the side of camera to the 0 dB position and note the pedestal level at TP3.
- Set the High Gain Selection Switch to the +12 dB position and adjust G BL OFFSET VR29 on the Deflection board so that the pedestal level at TP3 is same as the noted level. (Fig. 4-8-4)

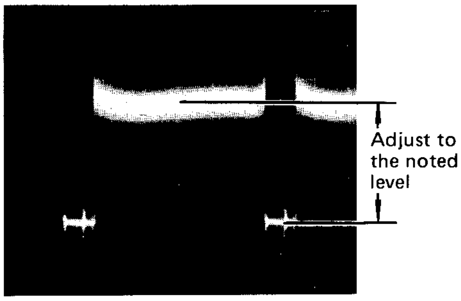


Fig. 4-8-4

- Set the Selection Switch to the 0 dB position and note the pedestal level again.
- Set the Selection Switch to the +12 dB position again and readjust VR29 so that the pedestal level is same as the noted level.
- Repeat this procedure until the pedestal level stays same at the 0 dB and +12 dB position. (Fig. 4-8-5)

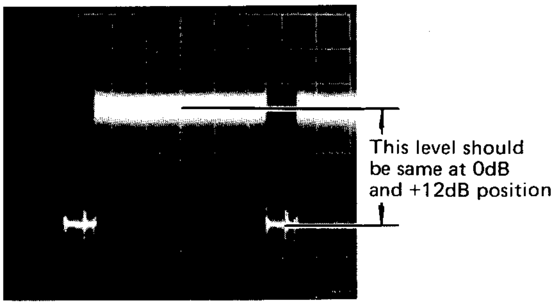


Fig. 4-8-5

- Adjust R and B blanking offset in the same manner.

■ **R blanking offset adjustment**

- Adjust R BL OFFSET VR34 on the Deflection board as in the case of G blanking offset adjustment so that the pedestal level at TP2 on the Process-2 board stays same at the 0 dB and +12 dB position of High Gain Selection Switch.

■ **B blanking offset adjustment**

- Adjust B BL OFFSET VR24 on the Deflection board as in the case of G blanking offset adjustment so that the pedestal level at TP1 on the Process-2 board stays same at the 0 dB and +12 dB position of High Gain Selection Switch.

(d) Pedestal preset adjustment

Test points :	TP3 (G)	Process-2 board
	TP2 (R)	〃 〃
	TP1 (B)	〃 〃
Adjusts :	VR2 (G PEDESTAL PRESET)	Process-1 board
	VR4 (R PEDESTAL PRESET)	〃 〃
	VR6 (B PEDESTAL PRESET)	〃 〃

- Close the lens iris or set the filter wheel to the position 4 .
- Set the High Gain Selection Switch to the 0 dB position.
- Connect the digital voltmeter (DVM) to TP3 on the Process-2 board.
- Adjust G PEDESTAL PRESET VR2 for +4.40V.
- Connect the DVM probe to TP2 on the Process-2 board and adjust R PEDESTAL PRESET VR4 for +4.40V as in the case of G pedestal preset adjustment.

- Connect the DVM probe to TP1 on the Process-2 board and adjust B PEDESTAL PRESET VR6 for +4.40V as in the case of G pedestal preset adjustment.

(e) Vertical detail (aperture) balance adjustment

Test point :	TP7	Process-2 board
Adjust :	VR5 (V DETAIL BALANCE)	〃 〃

- Set the Detail On/Off Switch SW4 on the Switch board of Deflection board to the ON (upper) position. (Fig. 4-8-6)

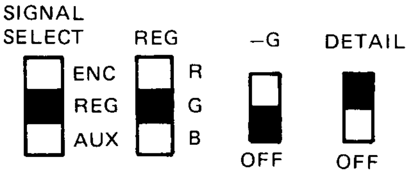
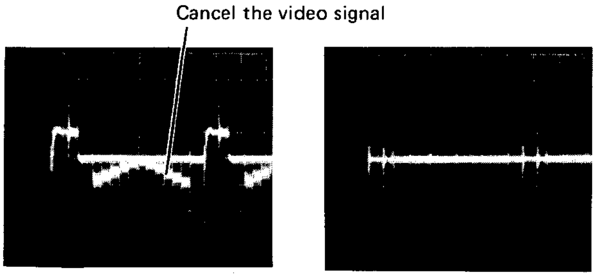


Fig. 4-8-6

- Aim the camera at the logarithmic gray scale chart and set the lens iris to F4.
- Connect the oscilloscope to TP7.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust V DETAIL BALANCE VR5 to cancel the video signal. (Fig. 4-8-7)



NO GOOD GOOD

Fig. 4-8-7

(f) Detail (aperture) noise suppress adjustment

Test point :	TP7	Process-2 board
Adjusts :	VR16 (DETAIL NOISE SUPPRESS)	〃
	VR17 (DETAIL GAIN)	〃

- Aim the camera at the logarithmic gray scale chart and set the lens iris to F4.

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

- Connect the oscilloscope to TP7.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Set DETAIL GAIN VR17 to its mechanical center.
- Turn DETAIL NOISE SUPPRESS VR16 fully counterclockwise to release the suppression.
- Note the noise level at TP7. (Fig. 4-8-8)

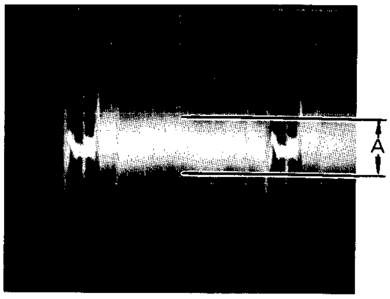


Fig. 4-8-8

- Adjust DETAIL NOISE SUPPRESS VR16 so that the noise level is one third (1/3) of noted level. (Fig. 4-8-9)

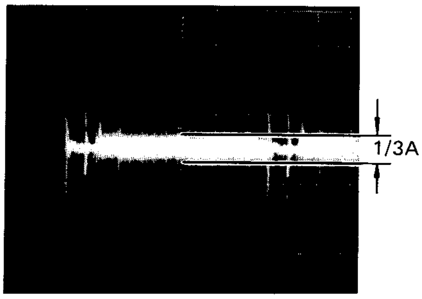


Fig. 4-8-9

(g) Detail (aperture) level adjustment

Test point :	TP6	Process-2 board
Adjusts :	VR17 (DETAIL GAIN)	〃 〃
	VR10 (H DETAIL LEVEL)	〃 〃
	VR11 (H/V MIX BALANCE)	〃 〃
	VR4 (G WHITE CLIP)	〃 〃

- Aim the camera at the white set (window) chart and set the lens iris to F4.
- Turn G WHITE CLIP VR4 fully clockwise to release the white clip.
- Set H/V MIX BALANCE VR11 to its mechanical center.
- Connect the oscilloscope to TP6.
- Trigger the oscilloscope at V rate (Use TP19, Mother board).

- Adjust DETAIL GAIN VR17 so that the vertical detail (aperture) signal is 50% higher than the G signal A. (Fig. 4-8-10)

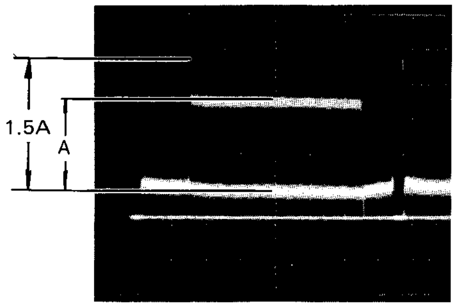


Fig. 4-8-10

- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust H DETAIL LEVEL VR10 so that the average horizontal detail (aperture) signal (C + D)/2 is 40% higher than the G signal A. (Fig. 4-8-11)

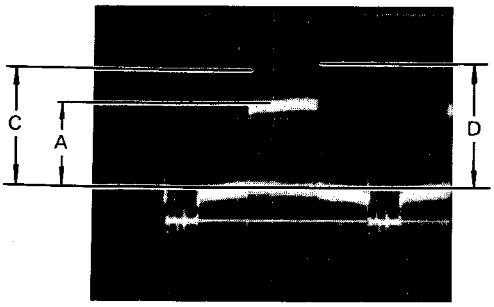


Fig. 4-8-11

- After adjusting the next step, confirm the detail (aperture) level adjustment.

(h) G gamma, pedestal and gain adjustment

Test point :	**TP6**	**Process-2 board**	
Adjusts :	VR1 (G GAMMA)	″	″
	VR2 (G GAIN)	″	″
	VR3 (G PEDESTAL)	″	″

- Aim the camera at the logarithmic gray scale chart and set the lens iris to F4.
- Connect the oscilloscope to TP6 and trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust G GAMMA VR1 so that the gray scale waveform is straight. (Fig. 4-8-12)

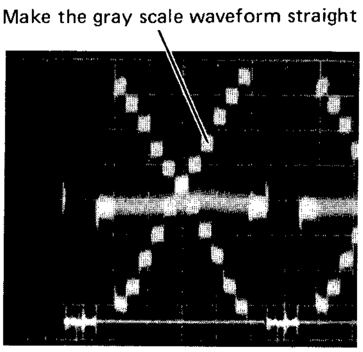
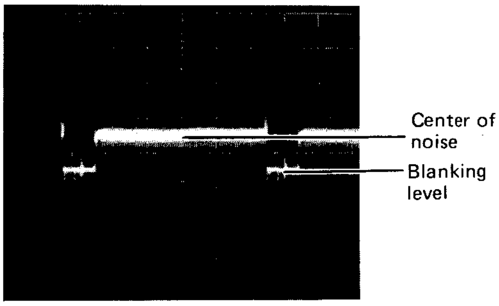

Make the gray scale waveform straight

Fig. 4-8-12

- Close the lens or set the filter wheel to the position 4.
- Connect the oscilloscope to TP6.
- Turn G PEDESTAL VR3 clockwise to observe the signal as shown in Fig. 4-8-15. Turn VR3 back until the pedestal level is zero (The blanking level coincides with the center of noise.). (Fig. 4-8-16)


Center of noise

Blanking level

Fig. 4-8-15

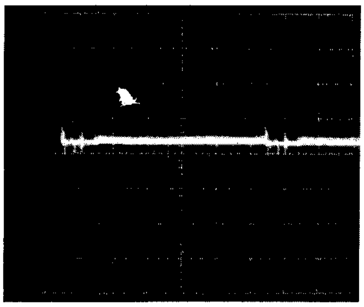


Fig. 4-8-16

- Set the lens iris to F4 and aim the camera at the gray scale.
- Adjust G GAIN VR2 so that the signal level between the blanking level and the top step of gray scale waveform is 0.65 Vp-p. (Fig. 4-8-17)

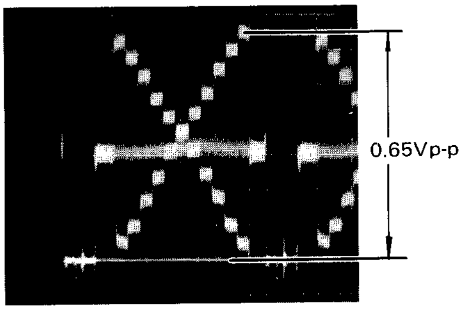


Fig. 4-8-17

(i) R gamma, pedestal and gain adjustment

Test points :	TP5 (R)	Process-2 board
	TP6 (G)	″ ″
Adjusts :	VR6 (R GAMMA)	″ ″
	VR7 (R GAIN)	″ ″
	VR8 (R PEDESTAL)	″ ″

- Aim the camera at the logarithmic gray scale chart and set the lens iris to F4.
- Connect the oscilloscope to TP5 and TP6.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Overlay the R signal and G signal on the oscilloscope and adjust R GAMMA VR6 so that the shape of R signal waveform proportionally coincides with the G signal waveform. (Fig. 4-8-18)

  Note : Do not pay attention to the signal level. It will be adjusted in the next step. Overlay the signals using the variable voltage (calibration) control of oscilloscope.

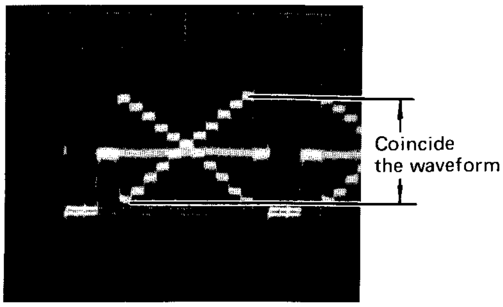
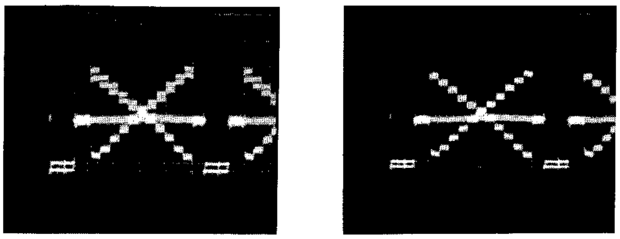


Fig. 4-8-18

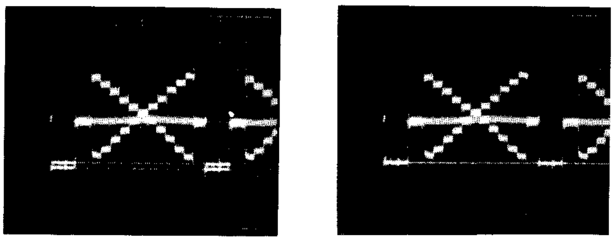
- Reset the variable voltage control of oscilloscope to the calibrating position.
- Overlay the R signal and G signal and adjust R GAIN VR7 so that the signal level between the black chip (zero step) and white chip (top step) of the gray scale waveform match. (Fig. 4-8-19)



NO GOOD GOOD

Fig. 4-8-19

- Adjust R PEDESTAL VR8 so that the black level between the blanking level and the black chip (zero step) of the gray scale waveform match. (Fig. 4-8-20)



NO GOOD GOOD

Fig. 4-8-20

- Fine-adjust R GAMMA VR6, R GAIN VR7 and R PEDESTAL VR8 so that the R and G signal waveforms coincide each other.

(j) B gamma, pedestal and gain adjustment

Test points :	TP4 (B)	Process-2 board
	TP6 (G)	〃 〃
Adjusts :	VR12 (B GAMMA)	〃 〃
	VR13 (B GAIN)	〃 〃
	VR14 (B PEDESTAL)	〃 〃

- Aim the camera at the logarithmic gray scale chart and set the lens iris to F4.
- Connect the oscilloscope to TP4 and TP6.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Overlay the B signal and G signal on the oscilloscope and adjust B GAMMA VR12 so that the shape of B signal waveform proportionally coincides with the G signal waveform. (Fig. 4-8-21)

  Note : Do not pay attention to the signal level. It will be adjusted in the next step. Overlay the signals using the variable voltage (calibration) control of oscilloscope.

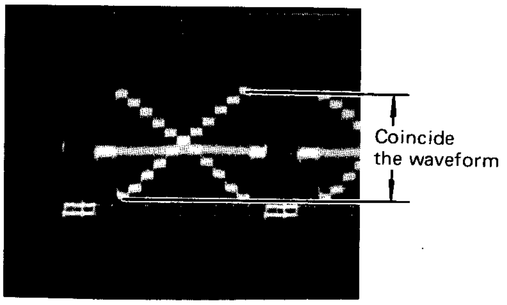


Fig. 4-8-21

- Reset the variable voltage control of oscilloscope to the calibrating position.
- Overlay the B signal and G signal and adjust B GAIN VR13 so that the signal level between the black chip (zero step) and white chip (top step) of the gray scale waveform match. (Fig. 4-8-22)

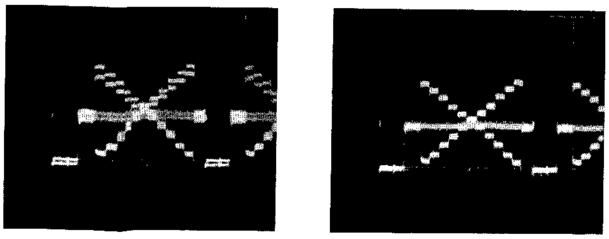

NO GOOD GOOD

Fig. 4-8-22

- Adjust the B PEDESTAL VR14 so that the black level between the blanking level and the black chip (zero step) of the gray scale waveform match. (Fig. 4-8-23)

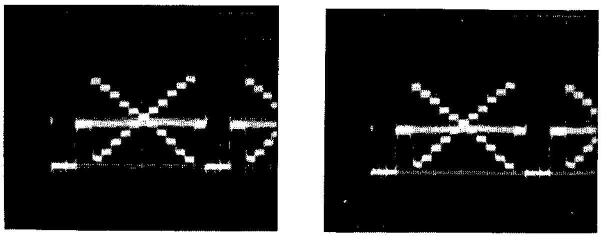

NO GOOD GOOD

Fig. 4-8-23

- Fine-adjust B GAMMA VR12, B GAIN VR13 and B PEDESTAL VR14 so that the B and G signal waveforms coincide each other.

(k) White balance fine adjustment

Test point :	VIDEO OUT	
Adjusts :	VR6 (R GAMMA)	Process-2 board
	VR7 (R GAIN)	〃 〃
	VR8 (R PEDESTAL)	〃 〃
	VR12 (B GAMMA)	〃 〃
	VR13 (B GAIN)	〃 〃
	VR14 (B PEDESTAL)	〃 〃

- Aim the camera at the gray scale chart and set the lens iris to F4.
- Connect the oscilloscope to the terminated VIDEO OUT signal or connect the VIDEO OUT to the waveform monitor.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Fine-adjust R GAMMA VR6, R GAIN VR7, R PEDESTAL VR8, B GAMMA VR12, B GAIN VR13 and B PEDESTAL VR14 so the carrier on the PAL signal is minimum. (Fig. 4-8-24)

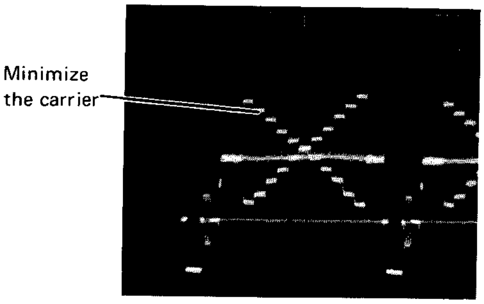


Fig. 4-8-24

(l) White clip adjustment

Test points :	TP6	Process-2 board
	VIDEO OUT	
Adjusts :	VR4 (G WHITE CLIP)	Process-2 board
	VR9 (R WHITE CLIP)	" "
	VR15 (B WHITE CLIP)	" "

- Aim the camera at the gray scale chart and set the lens iris to F2.8.
- Connect the oscilloscope to TP6.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust G WHITE CLIP VR4 so that the G signal is clipped at 0.75 Vp-p. (Fig. 4-8-25)

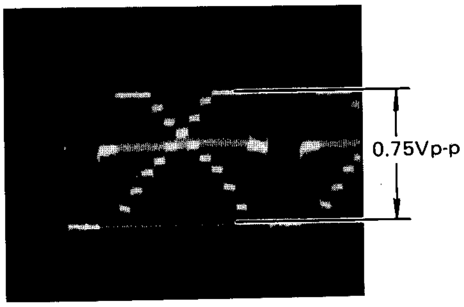
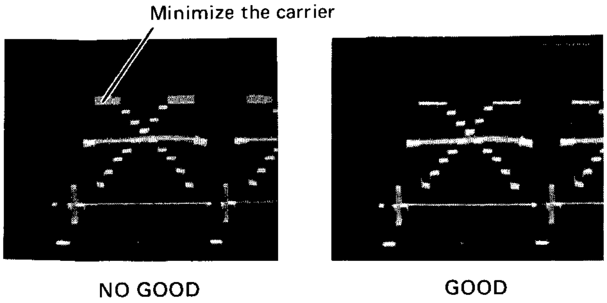


Fig. 4-8-25

- Connect the oscilloscope to the terminated VIDEO OUT signal or connect the VIDEO OUT to the waveform monitor.
- Adjust R WHITE CLIP VR9 and B WHITE CLIP VR15 so that the carrier on the clip portion of the gray scale waveform is minimum. (Fig. 4-8-26)



NO GOOD GOOD

Fig. 4-8-26

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

(m) Feedback beam control adjustment

Test points :	VIDEO OUT	
	TP1 (G)	Process-1 board
	TP3 (R)	" "
	TP6 (B)	" "
Adjusts :	VR8 (G FBC LEVEL)	High voltage board
	VR7 (R FBC LEVEL)	" "
	VR9 (B FBC LEVEL)	" "

- Aim the camera at the logarithmic gray scale chart on which illumination is more than 4000 lux.
- Adjust the camera so that the white chip of gray scale chart positions at the center of the monitor screen.
- Connect the oscilloscope to the terminated VIDEO OUT signal or connect the VIDEO OUT connector to the waveform monitor.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust the lens iris so that the PAL output level is 0.7 Vp-p. (Fig. 4-8-27)

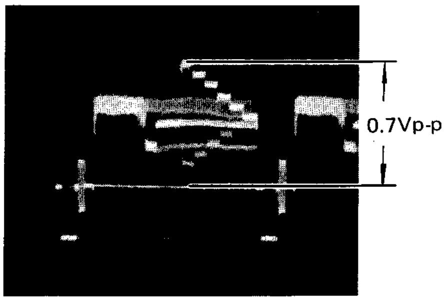


Fig. 4-8-27

- Connect the oscilloscope to TP1 on the Process-1 board.
- Note the peak-to-peak signal level. (Fig. 4-8-28)

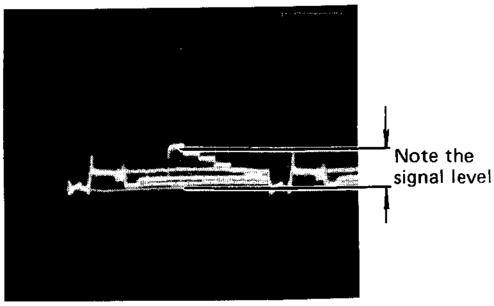


Fig. 4-8-28

- Set the lens iris fully opened.
- Adjust G FBC LEVEL VR8 on the High voltage board so that the peak-to-peak signal level is eight (8) times of the noted level. (Fig. 4-8-29)

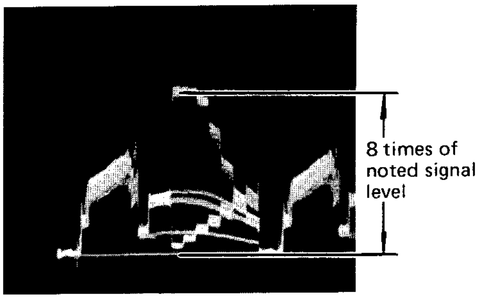


Fig. 4-8-29

- Adjust the feedback beam control for red and blue signals as in the case of the green signal.
- Adjust the lens iris so that the PAL output level is 0.7 Vp-p. (Fig. 4-8-27)
- Connect the oscilloscope to TP3 (R) and TP6 (B) on the Process-1 board.
- Note the peak-to-peak signal level of R and B signal. (Fig. 4-8-28)
- Set the lens iris fully opened.
- Adjust R FBC LEVEL VR7 and B FBC LEVEL VR9 so that the peak-to-peak signal level of R and B signals are eight (8) times of the noted level. (Fig. 4-8-29)
- Pan the camera right and left and confirm that the trailing side of white chip of gray scale chart has no color at the lens iris fully opened. If not, readjust above steps.

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

4-9 Automatic Iris Board Adjustment

(a) AIC level adjustment

Test point :	VIDEO OUT	
Adjust :	VR1 (IRIS SET)	AIC board

- Connect pin 1 of 32P RCU connector to the ground.
- Set the Iris Control Selection Switch (IRIS AUTO/MAN/REM) on the lens to the REM position.
- Aim the camera at the logarithmic gray scale chart.
- Connect the oscilloscope to the terminated VIDEO OUT signal or connect the VIDEO OUT connector to the waveform monitor.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust IRIS SET VR1 on the AIC board (Fig. 4-9-1) so that the PAL signal level is 0.7 Vp-p. (Fig. 4-9-2)

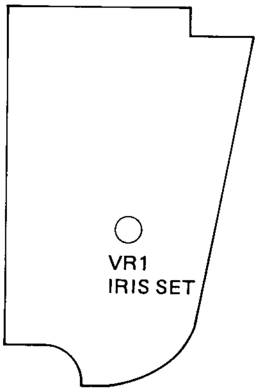


Fig. 4-9-1

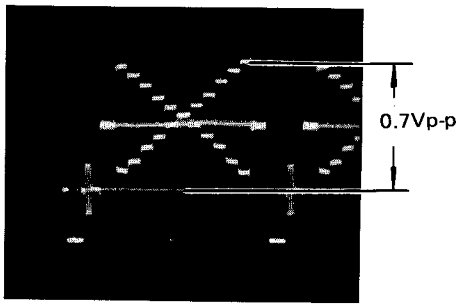


Fig. 4-9-2

4-10 1.5" Viewfinder WV-VF30 Adjustment

- Disassemble the 1.5" viewfinder WV-VF30 while referring to 2-2 1.5" Viewfinder WV-VF30 on page 2.
- Set the switches on the Switch board of Deflection board on the side of camera as shown in Fig. 4-10-1.

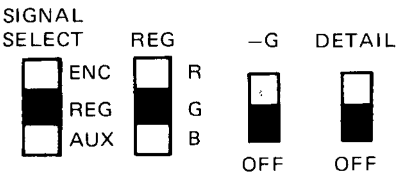


Fig. 4-10-1

- Refer to the separate booklet for the test points and adjusting controls.

(a) +1.8V adjustment

Test points : TP1 (+1.8V)
TP5 (GND)
Adjust : VR3 (+1.8V ADJ)

- Connect the digital voltmeter probe between TP1 (+1.8V) and TP5 (GND).
- Adjust +1.8V ADJ VR3 for +1.8V ± 0.05V.

(b) Horizontal hold adjustment

Test points : TP3 (H HOLD)
TP5 (GND)
Adjust : VR2 (H HOLD)

- Connect the digital voltmeter probe between TP3 and TP5 (GND).
- Adjust H HOLD VR2 for +2.6V and confirm that the picture is held horizontally.

(c) Picture tilt adjustment

Adjust : Deflection coil
Observe : Viewfinder

- Make sure the camera is level with the chart.
- Loosen the deflection coil holding screw. (Fig. 4-10-2)

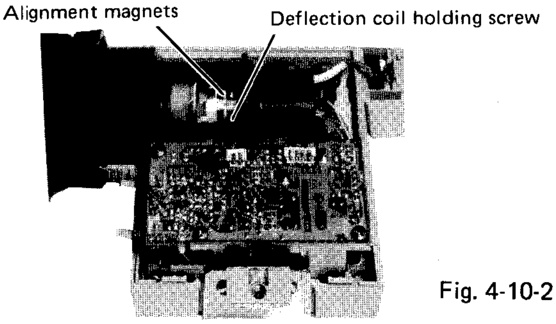


Fig. 4-10-2

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

- Observe the viewfinder and turn the deflection coil so that the image is straight.
- Tighten the deflection coil holding screw.

(d) Centering magnets adjustment

Adjusts : L4 (H SIZE)
VR1 (V SIZE)
Centering magnets
Observe : Viewfinder

- Reduce picture size using H SIZE L4 and V SIZE VR1 so that the entire raster is observed on the viewfinder.
- Aim the camera at the registration chart.
- Adjust the centering magnets (See FIg. 4-10-2) so that the raster comes to the center of viewfinder screen. (Fig. 4-10-3)

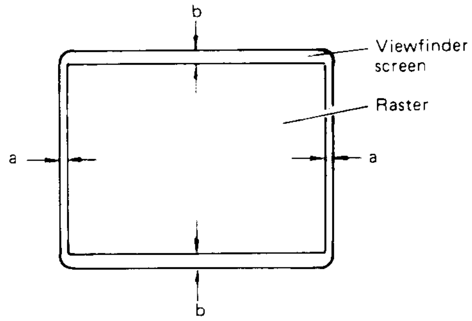


Fig. 4-10-3

(e) Horizontal and vertical size adjustment

Adjusts : L4 (H SIZE)
VR1 (V SIZE)
Observe : Viewfinder

- Aim the camera at the registration chart.
- Adjust H SIZE L4 and stop just before horizontal edges of raster touching to the both edges of viewfinder screen.
- Adjust V SIZE VR1 so that the circle in the chart is as rearly a true circle as possible.
- Confirm that the four corners of raster are observed on the viewfinder. If not, readjust the centering magnets.

(f) Contrast and brightness adjustment

Adjusts : VR4 (CONTRAST)
VR5 (BRIGHTNESS)
Observe : Viewfinder

- Aim the camera at the logarithmic gray scale chart.
- While changing the iris from the closed position to F2.8, adjust CONTRAST VR4 and BRIGHTNESS VR5 so that the black-and-white chip gradations will be the same on the viewfinder as that in the monitor.

(g) Focus adjustment

Adjust : VR6 (FOCUS)
Observe : Viewfinder

- Aim the camera at the resolution chart.
- Adjust FOCUS VR6 for best resolution in the viewfinder.

(h) Level indicator adjustment

Test points : TP2
TP5 (GND)
Adjusts : VR7 (CENTER ADJ)
VR8 (LOWER LIMIT)

- Aim the camera at the logarithmic gray scale chart.
- Cap the lens.
- Connect the digital voltmeter probe between TP2 and TP5 (GRD).
- Adjust LOWER LIMIT VR8 for +1.9V.
- Set the lens iris to F4.
- Adjust CENTER ADJ VR7 so that the white level indicator bar positions at the center of indicator mark in the viewfinder. (Fig. 4-10-4)

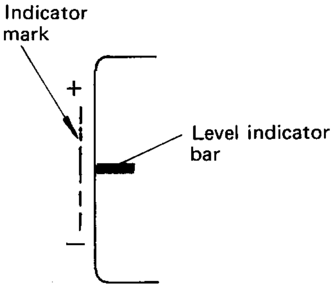


Fig. 4-10-4

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

4-11 5" Viewfinder WV-VF35 Adjustment

- Disassemble the 5" viewfinder WV-VF35 while referring to 2-3 5" Viewfinder WV-VF35 on page 3.
- Set the switches on the Switch board of Deflection board on the side of camera as shown in Fig. 4-11-1.

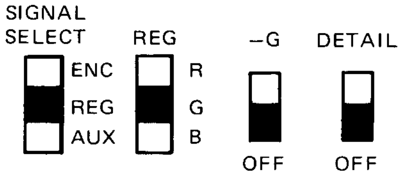


Fig. 4-11-1

- Refer to the separate booklet for the test points and adjusting controls.

(a) Horizontal and Vertical hold preset adjustment

Adjusts : VR100 (V HOLD)
VR202 (H HOLD)

- While observing the viewfinder, adjust V HOLD VR100 and H HOLD VR202 so that picture in the viewfinder is locked vertically and horizontally.

(b) Picture tilt adjustment

Adjust : Deflection coil
Observe : Viewfinder

- Remove the screws fixing the printed circuit boards. (Fig. 4-11-2)

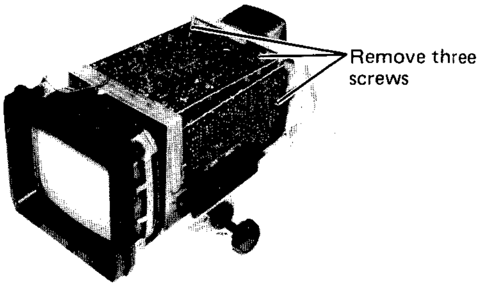


Fig. 4-11-2

- Loosen two screws holding the front panel (Fig. 4-11-3) and remove the front panel. (Fig. 4-11-4)

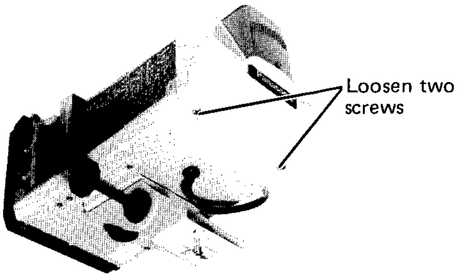


Fig. 4-11-3

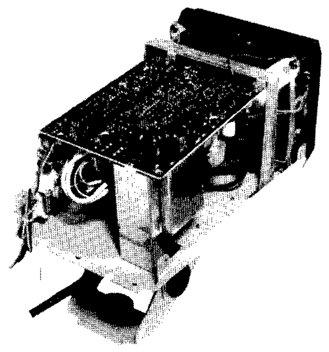


Fig. 4-11-4

- Make sure the camera is level with the chart.
- Loosen the deflection coil holding screw. (Fig. 4-11-5)

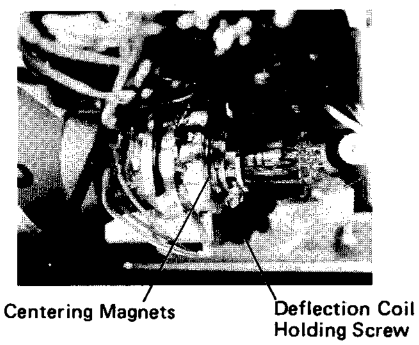


Fig. 4-11-5

- Observe the viewfinder and turn the deflection coil so that the image is straight.
- Tighten the deflection coil holding screw.

(c) Centering magnets adjustment

Adjusts :	L3 (H SIZE) VR103 (V SIZE) Centering magnets
Observe :	Viewfinder

- Reduce picture size using H SIZE L3 and V SIZE VR103 so that the entire raster is observed on the viewfinder.
- Aim the camera at the registration chart.
- Adjust the centering magnets (See Fig. 4-11-5) so that the raster comes to the center of viewfinder screen. (Fig. 4-11-6)

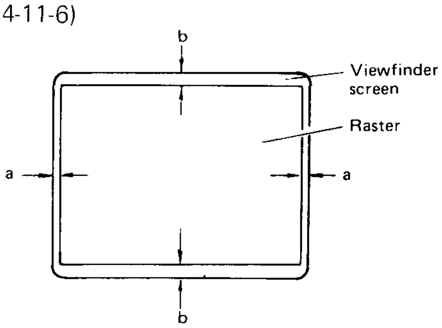


Fig. 4-11-6

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

(d) Horizontal and vertical size, vertical linearity adjustment

Adjusts :	L3 (H SIZE) VR103 (V SIZE) VR102 (V LIN)
Observe :	Viewfinder

- Aim the camera at the registration chart.
- Set CONTRAST VR1 and BRIGHTNESS VR2 to the optimum position.
- Adjust H SIZE L3 so that the horizontal size of raster is 9.5 ± 0.1 cm.
- Adjust V SIZE, VR103 and V LIN VR102 repeatedly so that the circle in the chart is as rearly a true circle as possible.

  Note : If the picture jumps or rolls vertically in this adjustment, readjust V HOLD VR100.

(e) Horizontal and vertical hold adjustment

Test points :	Pin 3 of CN4 Pin 4 of CN4
Adjusts :	VR100 (V HOLD) VR202 (H HOLD)
Observe :	Viewfinder

- While observing the viewfinder, turn V HOLD VR100 clockwise and counterclockwise to confirm the vertical hold range of VR100.
- Set VR100 to the mechanical center of its vertical hold range.
- Connect the oscilloscope to pin 3 and pin 4 of CN4.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust H HOLD VR202 so that the leading edge of horizontal blanking pulse at pin 4 coincides with the leading edge of blanking duration at pin 3. (Fig. 4-11-7)

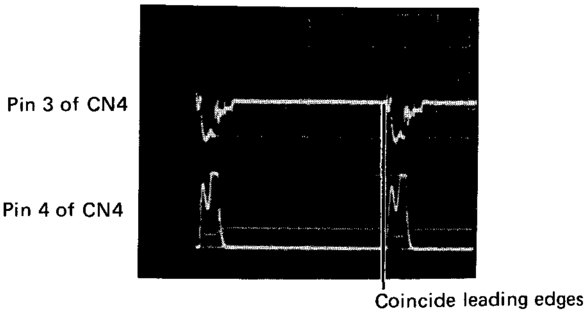


Fig. 4-11-7

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

- Turn ON and OFF the power switch and confirm that the picture in the viewfinder is locked horizontally and vertically.
- Confirm that the raster positions at the center of viewfinder screen. If not, readjust (c) Centering magnets adjustment.

(f) Brightness preset adjustment

Adjusts : VR1 (CONTRAST)
VR2 (BRIGHTNESS)
VR3 (BRIGHTNESS PRESET)
Observe : Viewfinder

- Turn CONTRAST VR1 and BRIGHTNESS VR2 fully counterclockwise.
- Return BRIGHTNESS VR2 about 45° so that the slit of brightness control knob positions level. (Fig. 4-11-8)

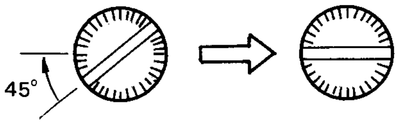


Fig. 4-11-8

- Adjust BRIGHTNESS PRESET VR3 so that the raster just disappears.

(g) Contrast and brightness adjustment

Adjusts : VR1 (CONTRAST)
VR2 (BRIGHTNESS)
Observe : Viewfinder

- Aim the camera at the logarithmic gray scale chart.
- While changing the iris from the closed position to F2.8, adjust CONTRAST VR1 and BRIGHTNESS VR2 so that the black-and-white chip gradations will be the same on the viewfinder as that in the monitor.

(h) Focus adjustment

Adjust : VR203 (FOCUS)
Observe : Viewfinder

- Aim the camera at the resolution chart.
- Adjust FOCUS VR203 for best resolution in the viewfinder.

(i) Level indicator adjustment

Adjusts : VR200 (CENTER ADJ)
VR204 (LOWER LIMIT)
VR205 (UPPER LIMIT)
Observe : Viewfinder

- Aim the camera at the logarithmic gray scale chart.
- Set the lens iris to F2.8.
- Turn UPPER LIMIT VR205 clockwise so that the level indicator moves down.
- Turn back VR205 slowly to move up and stop it at a point where the indicator just stops moving. Then turn VR205 counterclockwise slightly more.
- Cap the lens.
- Adjust LOWER LIMIT VR204 so that the level indicator positions at 5~7mm above the lower edge of raster. (Fig. 4-11-9)
- Set the lens iris to F4.
- Adjust CENTER ADJ VR200 so that the level indicator positions at the center of raster. (Fig. 4-11-9)

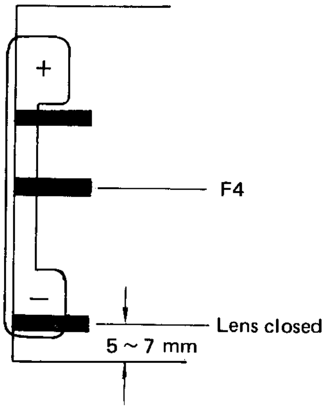


Fig. 4-11-9

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

4-12 Remote Control Unit (RCU) WV-RC30 Adjustment

- Disassemble the remote control unit (RCU) WV-RC30 while referring to 2-4 Remote Control Unit WV-RC30 on page 3.
- Refer to the separate booklet for the test points and adjusting controls.

(a) Connection and setting up for adjustment

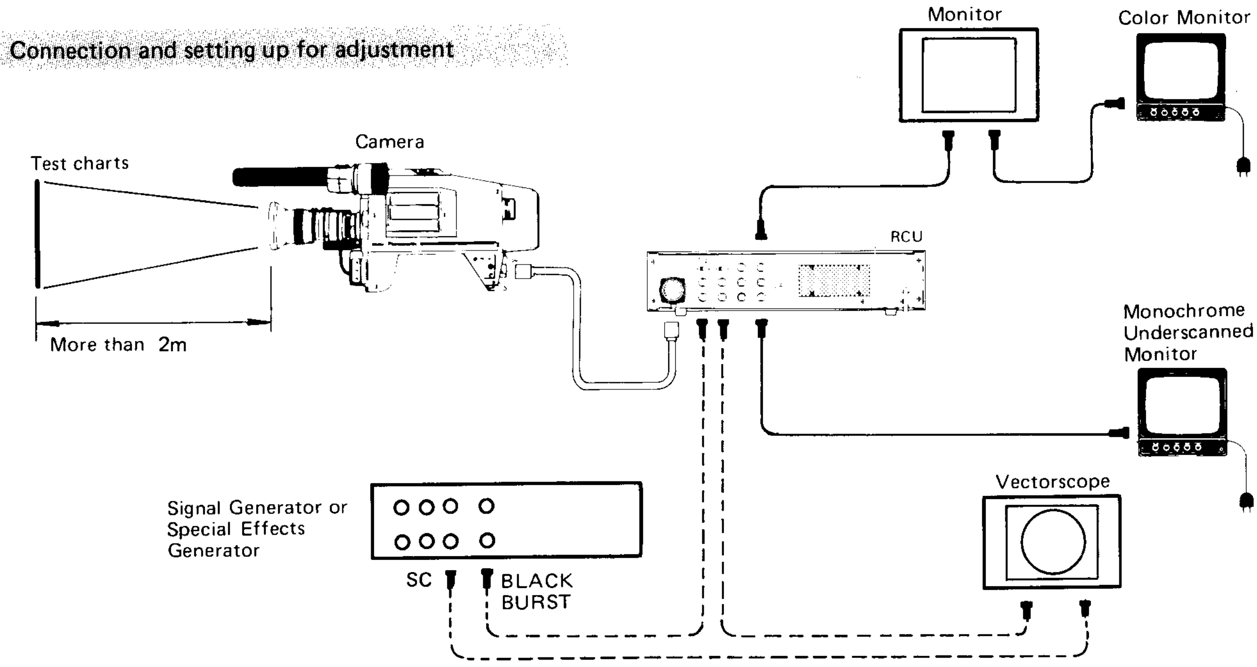


Fig. 4-12-1

Connection

- Connect the camera and the remote control unit (RCU) using a 7.5m 32p camera cable.
- Connect the VIDEO OUT connector on the RCU to the VIDEO IN connector of color monitor through the waveform monitor using a coaxial cable.
- Terminate the video input of color video monitor with 75 ohms.
- Connect the PIX OUT connector on the RCU to the VIDEO IN of monochrome underscanned video monitor using a coaxial cable.
- Terminate the video input of monochrome video monitor with 75 ohms.
- Connect the BLACK BURST OUT of special effects generator or signal generator to the GEN-LOCK IN connector of RCU using a coaxial cable when instructed.
- Connect the vectorscope when instructed.
- Connect the SC (subcarrier) OUT of special effects generator or signal generator to the external subcarrier reference (EXT CW ϕ REF) connector of vectorscope using a coaxial cable when instructed.

Position of controls and switches on the camera and RCU

(Camera)	
VTR-RCU Selector Switch	RCU
Power Selection Switch	VTR/RCU
(Lens)	
Iris Control Selection Switch	MAN
(RCU)	
Auto/Manual Selection Switch	MANUAL
Camera/Color Bar Selection Switch	BAR
Cable Length Compensation Switch	50m (150ft)
Subcarrier Phase Coarse Switch	0°
Subcarrier Phase Fine Control	Fully counter-clockwise
Horizontal Phase Control	Fully counter-clockwise
Gain and Pedestal Controls	Center detent
Monitoring Signal Select Switch	ENC
Registration Switch	G
−G ON/OFF Switch	OFF
Detail ON/OFF Switch	OFF
Centering Controls	Center

(b) +12V adjustment (Switching regulator board)

Test point : Pin 1 of IC11
Adjust : VR51 (+12V ADJ)

- Connect the digital voltmeter probe between pin 1 of IC11 and ground.
- Adjust +12V ADJ VR51 on the Switching regulator board for + 12.7V.

(c) Sync balance adjustment

Test point : TP3
Adjust : VR1 (SYNC BALANCE)

- Connect the BLACK BURST OUT of special effects generator or signal generator to the GEN-LOCK IN connector of RCU.
- Connect the oscilloscope to TP3.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust SYNC BALANCE VR1 to cancel the sync signal. (Fig. 4-12-2)

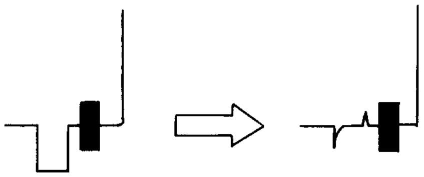


Fig. 4-12-2

(d) Burst gate adjustment

Test points : TP1
TP2
Adjust : VR2 (BURST GATE)

- Keep the Black Burst signal connected as in the preceding step.
- Connect the oscilloscope to TP1 and TP2.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Expand the burst signal portion on the oscilloscope.
- Adjust BURST GATE VR2 so that the leading edge of burst gate pulse at TP2 lags 5.2μsec the leading edge of sync signal at TP1. (Fig. 4-12-3)

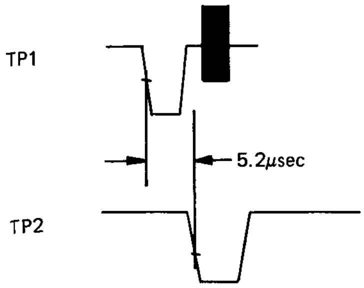


Fig. 4-12-3

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

(e) Black burst adjustment

Test points : TP4
Adjusts : VR3 (SC 90° PHASE)
VR4 (SYNC LEVEL)
VR5 (BLACK BURST LEVEL)
Observe : Vectorscope

- Keep the Black Burst signal connected as in the preceding step.
- Disconnect CN2 and CN16 from the Main board.
- Connect TP4 and the AUX connector on the rear of RCU with a lead wire and set the AUX input termination switch to the Hi-Z position.
- Connect the vectorscope to the AUX connector and terminate the input of vectorscope with 75 ohms.
- Supply an external subcarrier signal to the external subcarrier reference (EXT CW ϕ REF) connector of vectorscope from the signal generator or special effects generator.
- Set the burst mode (ϕ REF) of the vectorscope to the EXT position.
- Set SYNC LEVEL VR4 and BLACK BURST LEVEL VR5 to their mechanical center.
- Set the SC PHASE COARSE SWITCH SW5 to the 0° position and turn SC PHASE FINE VR46 fully counterclockwise.
- Turn the phase control of vectorscope so that the burst vector for even field positions at the B-Y(U) axis of vectorscope.
- Set the SC PHASE COARSE SWITCH SW5 to the 90° position.
- Adjust SC 90° PHASE VR3 so that the burst vector for even field coincides with the R-Y(V) axis on the vectorscope.
- Reset the COARSE SWITCH SW5 to the 0° position.
- Disconnect the lead wire between TP4 and the AUX connector and the vectorscope from the AUX connector.
- Connect the oscilloscope to TP14.
- Connect the oscilloscope at H rate (Use TP17, Mother board).
- Adjust BLACK BURST LEVEL VR5 so that the burst level is 1.6 Vp-p.
- Adjust SYNC LEVEL VR4 so that sync level is 1.1 Vp-p.
- Connect CN2 and CN16 to the Main board.

(f) Video output adjustment

Test points : Pin 3 of CN3
TP5
VIDEO OUT
Adjusts : VR6 (PAL GAIN PRESET)
VR7 (PAL GAIN)

- Keep the Camera/Color Bar Selection Switch set to the BAR position.
- Connect the oscilloscope to pin 3 of CN3 and TP5.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust PAL GAIN PRESET VR6 so that the color bar signal levels are equal.
- Move the probe of oscilloscope from TP5 to the terminated VIDEO OUT connector.
- Adjust PAL GAIN VR7 so that the color bar signal levels are equal.

(g) PIX output adjustment

Test points : PIX OUT
Pin 3 of CN3
Adjusts : VR17 (PIX GAIN)
VR18 (R, G, B SYNC LEVEL)
VR19 (R-G, B-G SYNC LEVEL)

- Set the switches on the front of RCU for registration adjustment as shown below for observing the encoded signal.

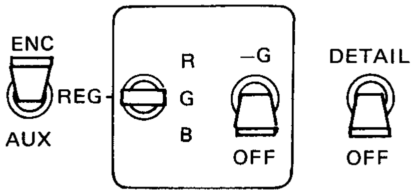


Fig. 4-12-4

- Connect the oscilloscope to the terminated PIX OUT connector and pin 3 of CN3.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust PIX GAIN VR17 so that the color bar signal levels are equal.
- Then set the MONITORING SIGNAL SELECT SW7 to the REG position to observe the green picture.
- Adjust R, G, B SYNC LEVEL VR18 so that the sync level is 0.3V.

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

- Set the switches for the registration adjustment as shown below.

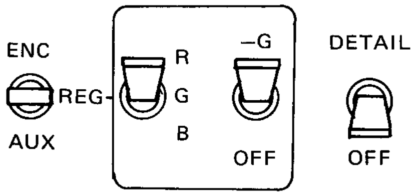


Fig. 4-12-5.

- Adjust R-G, B-G SYNC LEVEL VR19 so that the sync level is 0.6V.

(h) Green output adjustment

Test points : TP10
Pin 3 of CN6
G OUT
Adjusts : VR16 (G OUTPUT GAIN PRESET)
VR21 (G OUTPUT GAIN)

- Set the Camera/Color Bar Selection Switch to the CAMERA position.
- Aim the camera at the gray scale chart and set the lens iris to F4.
- Connect the oscilloscope to TP10 and pin 3 of CN6.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust G OUTPUT GAIN PRESET VR16 so that the green signal levels are equal.
- Move the probe of oscilloscope from TP10 to the terminated G OUT connector.
- Adjust G OUTPUT GAIN VR21 so that the green signal levels are equal.

(i) Red output and R-G adjustment

Test points : TP6
TP7
Pin 3 of CN4
R OUT
Adjusts : VR8 (R OUTPUT GAIN PRESET)
VR11 (R OUTPUT GAIN)
VR9 (R-G BALANCE)
VR10 (R-G GAIN)

- Keep the Camera/Color Bar Selection Switch set to the CAMERA position.
- Aim the camera at the gray scale chart and set the lens iris to F4.
- Connect the oscilloscope to TP6 and pin 3 of CN4.

- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust R OUTPUT GAIN PRESET VR8 so that the red signal levels are equal.
- Move the probe of oscilloscope from TP6 to the terminated R OUT connector.
- Adjust R OUTPUT GAIN VR11 so that the red signal levels are equal.
- Connect the oscilloscope at TP7.
- Adjust R-G BALANCE VR9 so that the signal level is zero.
- Connect the oscilloscope to TP6 and TP7.
- Disconnect CN6 from the Main board.
- Adjust R-G GAIN VR10 so that the red signal levels are equal.
- Connect CN6 to the Main board.

(j) Blue output and B-G adjustment

Test points : TP8
TP9
Pin 3 of CN5
B OUT
Adjusts : VR12 (B OUTPUT GAIN PRESET)
VR15 (B OUTPUT GAIN)
VR13 (B-G BALANCE)
VR14 (B-G GAIN)

- Keep the Camera/Color Bar Selection Switch set to the CAMERA position.
- Aim the camera at the gray scale chart and set the lens iris to F4.
- Connect the oscilloscope to TP8 and pin 3 of CN5.
- Trigger the oscilloscope at H rate (Use TP17, Mother board.
- Adjust B OUTPUT GAIN PRESET VR12 so that the blue signal levels are equal.
- Move the probe of oscilloscope from TP8 to the terminated B OUT connector.
- Adjust B OUTPUT GAIN VR15 so that the blue signal levels are equal.
- Connect the oscilloscope to TP9.
- Adjust B-G BALANCE VR13 so that the signal level is zero.
- Connect the oscilloscope to TP8 and TP9.
- Disconnect CN6 from the Main board.
- Adjust B-G GAIN VR14 so that the blue signal levels are equal.
- Connect CN6 to the Main board.

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

(k) AUX gain adjustment

Test points : AUX IN
TP11
Adjust : VR20 (AUX GAIN)

- Keep the Camera/Color Bar Selection Switch set to the CAMERA position.
- Aim the camera at the gray scale chart and set the lens iris to F4.
- Connect the VIDEO OUT connector and AUX IN connector on the rear of RCU using a coaxial cable.
- Set the AUX input termination switch to the 75 Ω position.
- Connect the oscilloscope to the AUX IN connector and TP11.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust AUX GAIN VR20 so that the signal levels especially the sync signals are equal.

  Note : The signal at TP11 has no chroma signal.

(l) Horizontal phase adjustment

Test point : TP12
Adjusts : VR22 (H PHASE PRESET)
VR47 (H PHASE)

- Turn H PHASE VR47 on the front of RCU fully clockwise.
- Connect the digital voltmeter probe to TP12.
- Adjust H PHASE PRESET VR22 for +3.5V.

(m) Iris preset adjustment

Test point : TP13
Adjust : VR43 (IRIS PRESET)

- Turn LENS IRIS CONTROL VR44 on the front of RCU fully counterclockwise and stop it just before switched to the AUTO position.
- Connect the digital voltmeter probe to TP13.
- Adjust IRIS PRESET VR43 for +1.8V.

(n) Gain preset adjustment

Test points : Center pin of VR26
Center pin of VR27
Adjusts : VR25 (R GAIN PRESET)
VR26 (R GAIN)
VR27 (B GAIN)
VR28 (B GAIN PRESET)

- Set R GAIN VR26 and B GAIN VR27 on the front of RCU to their center detent positions respectively.
- Connect the digital voltmeter (DVM) probe to the center pin of R GAIN VR26.
- Adjust R GAIN PRESET VR25 for +4.5V.
- Connect the DVM probe to the center pin of B GAIN VR27.
- Adjust B GAIN PRESET VR28 for +4.5V.

(o) Pedestal preset adjustment

Test points : Center pin of VR30
Center pin of VR31
Center pin of VR34
Adjusts : VR29 (TOTAL PED PRESET)
VR30 (TOTAL PED)
VR31 (R PED)
VR32 (R PED PRESET)
VR33 (B PED PRESET)
VR34 (B PED)

- Set TOTAL PED VR30, R PED VR31 and B PED VR34 on the front of RCU to their center detent positions respectively.
- Connect the digital voltmeter (DVM) probe to the center pin of TOTAL PED VR30.
- Adjust TOTAL PED PRESET VR29 for +4.5V.
- Connect the DVM probe to the center pin of R PED VR31.
- Adjust R PED PRESET VR32 for +3V.
- Connect the DVM probe to the center pin of B PED VR34.
- Adjust B PED PRESET VR33 for +3V.

(p) Centering preset adjustment

Test points : Center pin of VR36
Center pin of VR37
Center pin of VR40
Center pin of VR41
Adjusts : VR35 (R H-CENTERING PRESET)
VR36 (R H-CENTERING)
VR38 (B H-CENTERING PRESET)
VR37 (B H-CENTERING)
VR39 (R V-CENTERING PRESET)
VR40 (R V-CENTERING)
VR42 (B V-CENTERING PRESET)
VR41 (B V-CENTERING)

- Turn R H-CENTERING VR36, B H-CENTERING VR37, R V-CENTERING VR40 and B V-CENTERING VR41 fully clockwise.

Steps denoted by shaded outlines do not have to be performed if only pick-up tubes are replaced.

- Connect the digital voltmeter (DVM) probe to the center pin of R H-CENTERING VR36 and adjust R H-CENTERING PRESET VR35 for +9.2V.
- Connect the DVM probe to the center pin of B H-CENTERING VR37 and adjust B H-CENTERING PRESET VR38 for +9.2V.
- Connect the DVM probe to the center pin of R V-CENTERING VR40 and adjust R V-CENTERING PRESET VR39 for +9.2V.
- Connect the DVM probe to the center pin of B V-CENTERING VR41 and adjust B V-CENTERING PRESET VR42 for +9.2V.
- Aim the camera at the registration chart.
- Set the switches on the front of RCU for adjusting the registration as shown below in order to observe the R-G picture on the monochrome underscanned video monitor.

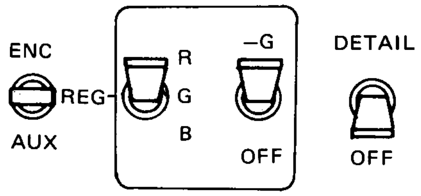


Fig. 4-12-6

- While observing the monochrome underscanned video monitor, adjust R H-CENTERING VR36 and R V-CENTERING VR40 so that the red (black line) and green (white line) pictures coincide with each other over the entire raster.
- Set the REGISTRATION SWITCH SW8 to the B position in order to observe the B-G picture.
- Adjust B H-CENTERING VR37 and B V-CENTERING VR41 so that the blue (black line) and green (white line) pictures coincide with each other over the entire raster.

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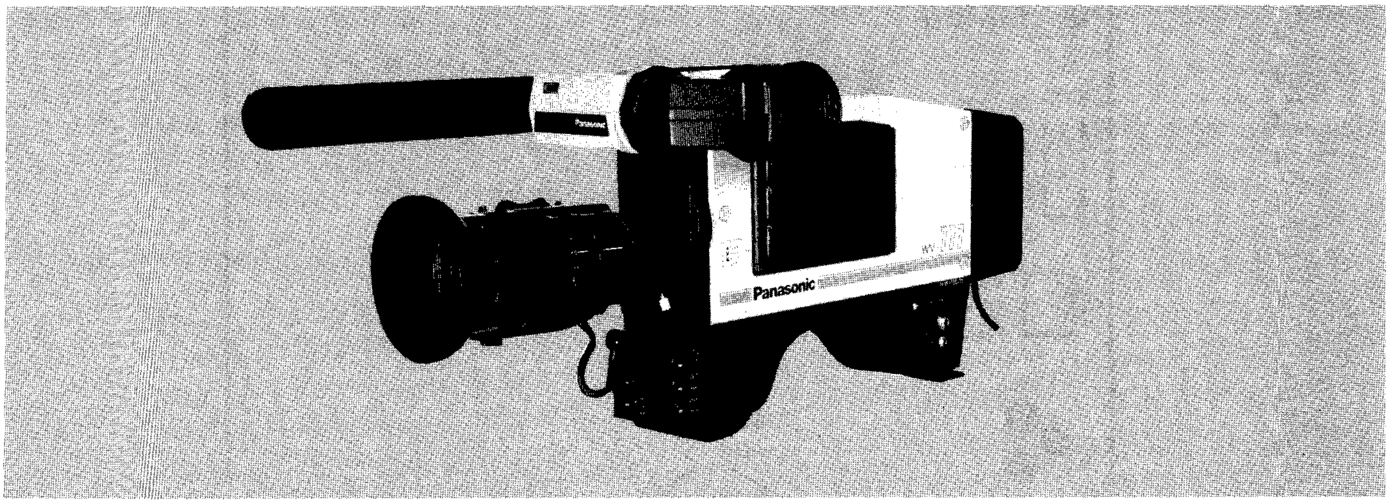
Service Manual

LOCATION OF TEST POINTS AND ADJUSTING CONTROLS

Colour Video Camera

WV-777 Series



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5" Viewfinder WV-VF35 13

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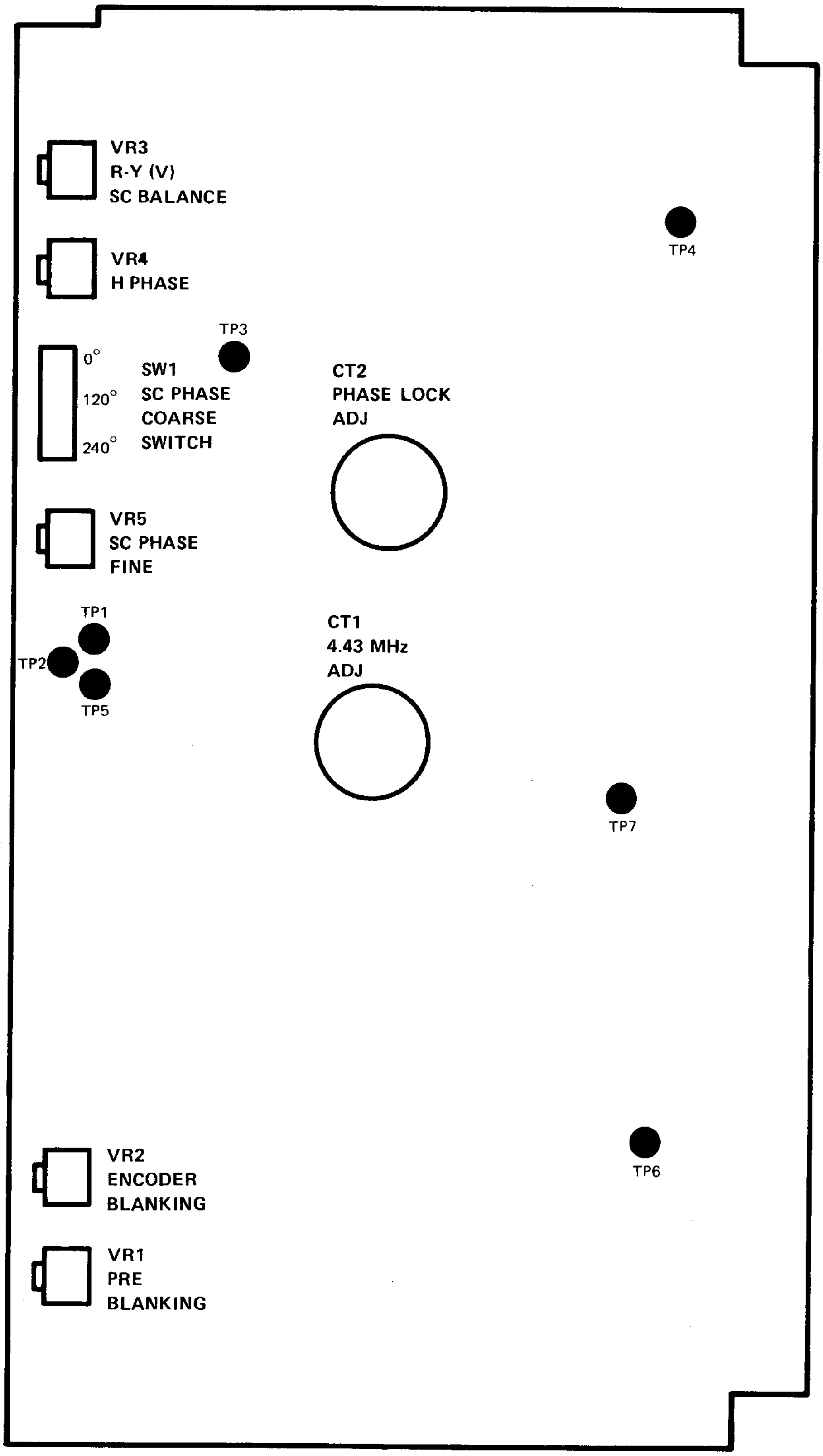
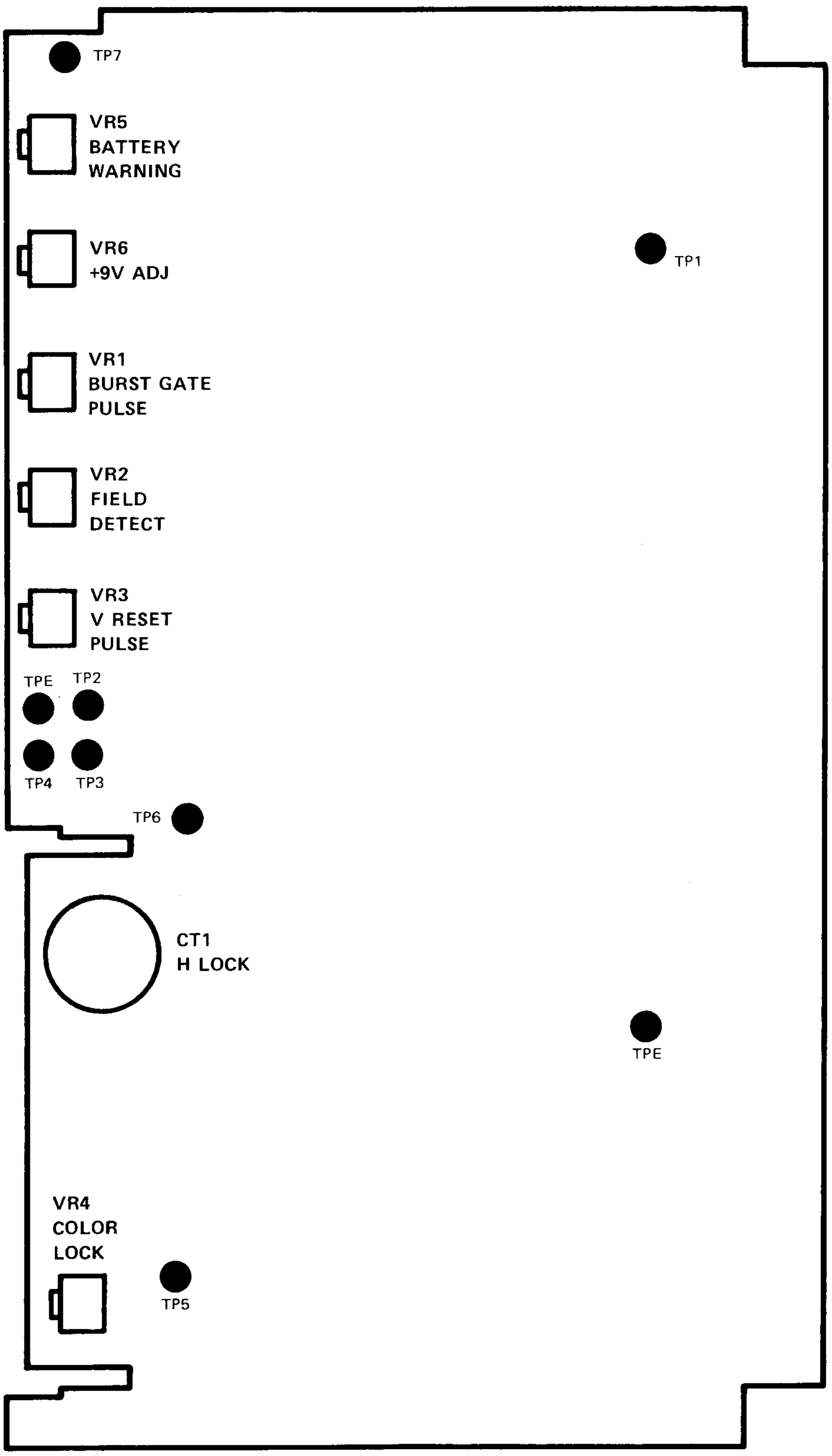
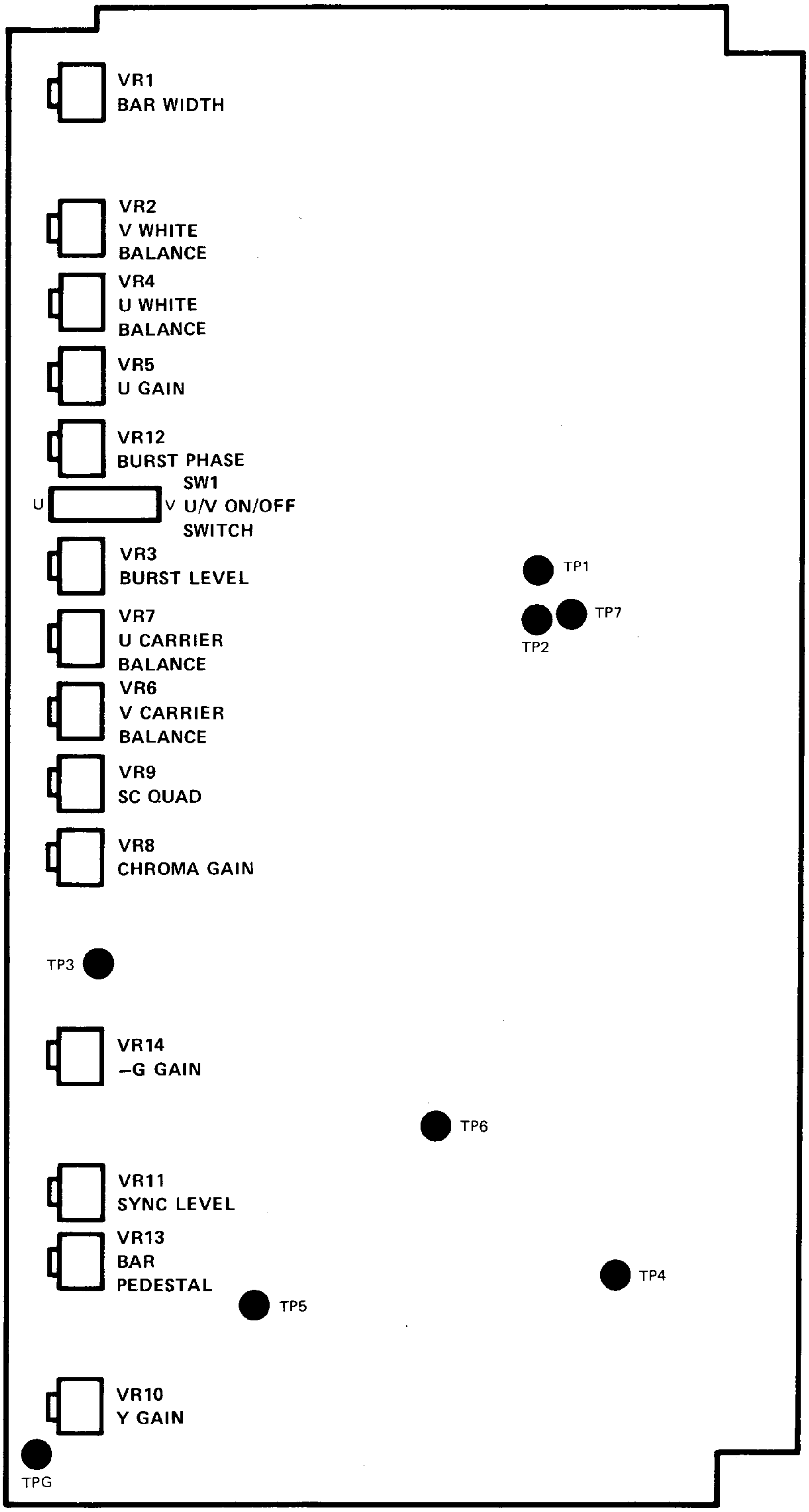
SYNC-1 BOARD —Component Side—


VR3
R-Y (V)
SC BALANCE
VR4
H PHASE
TP4
TP3
0°
120°
240°
SW1
SC PHASE
COARSE
SWITCH
CT2
PHASE LOCK
ADJ
VR5
SC PHASE
FINE
TP1
TP2
TP5
CT1
4.43 MHz
ADJ
TP7
TP6
VR2
ENCODER
BLANKING
VR1
PRE
BLANKING

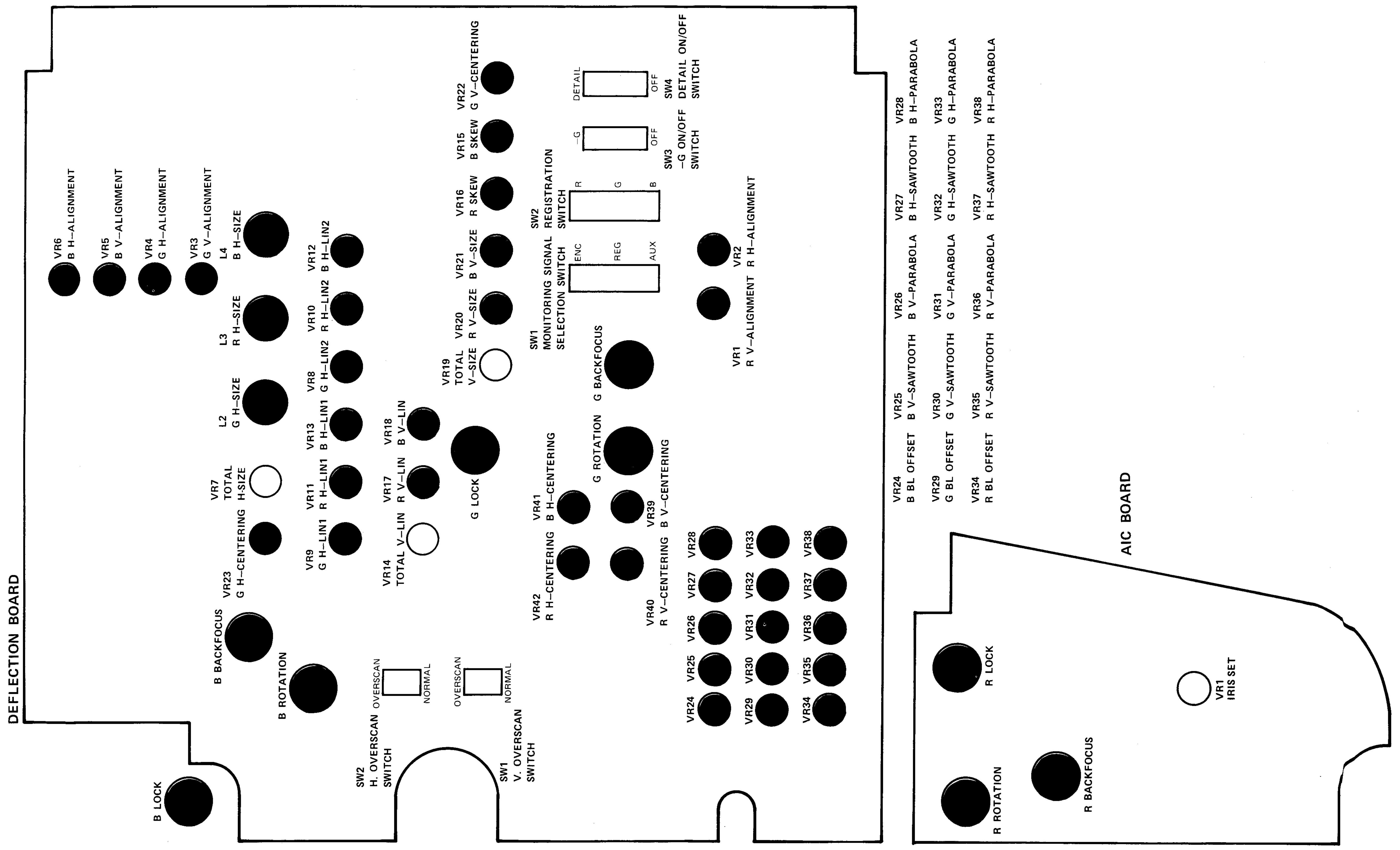
SYNC-2 BOARD —Component Side—


TP7
VR5
BATTERY
WARNING
VR6
+9V ADJ
TP1
VR1
BURST GATE
PULSE
VR2
FIELD
DETECT
VR3
V RESET
PULSE
TPE
TP2
TP4
TP3
TP6
CT1
H LOCK
TPE
VR4
COLOR
LOCK
TP5

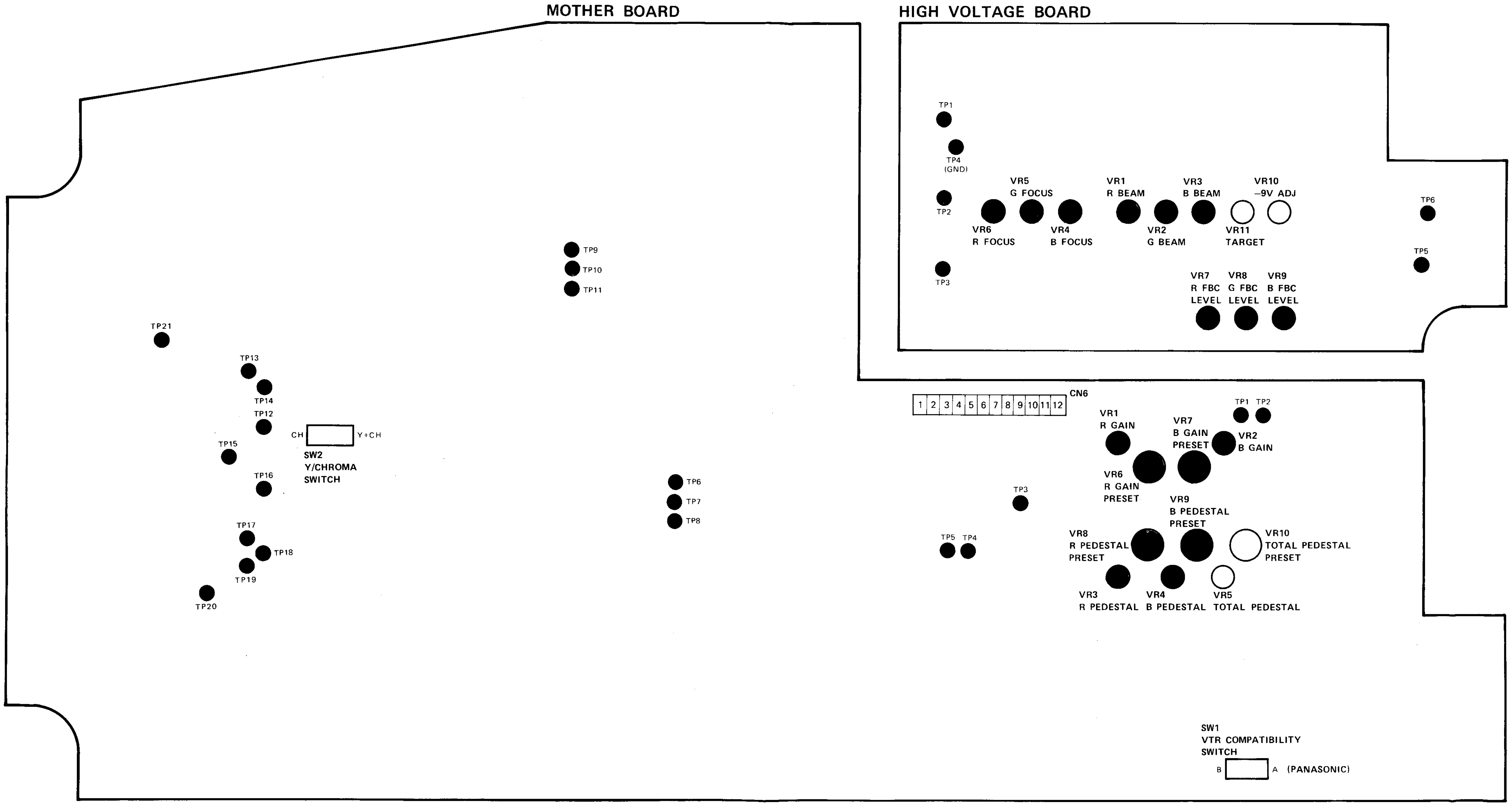
ENCODER BOARD —Component Side—


VR1
BAR WIDTH
VR2
V WHITE
BALANCE
VR4
U WHITE
BALANCE
VR5
U GAIN
VR12
BURST PHASE
SW1
U
V
U/V ON/OFF
SWITCH
VR3
BURST LEVEL
VR7
U CARRIER
BALANCE
VR6
V CARRIER
BALANCE
VR9
SC QUAD
VR8
CHROMA GAIN
TP1
TP7
TP2
TP3
VR14
−G GAIN
TP6
VR11
SYNC LEVEL
VR13
BAR
PEDESTAL
TP5
TP4
VR10
Y GAIN
TPG

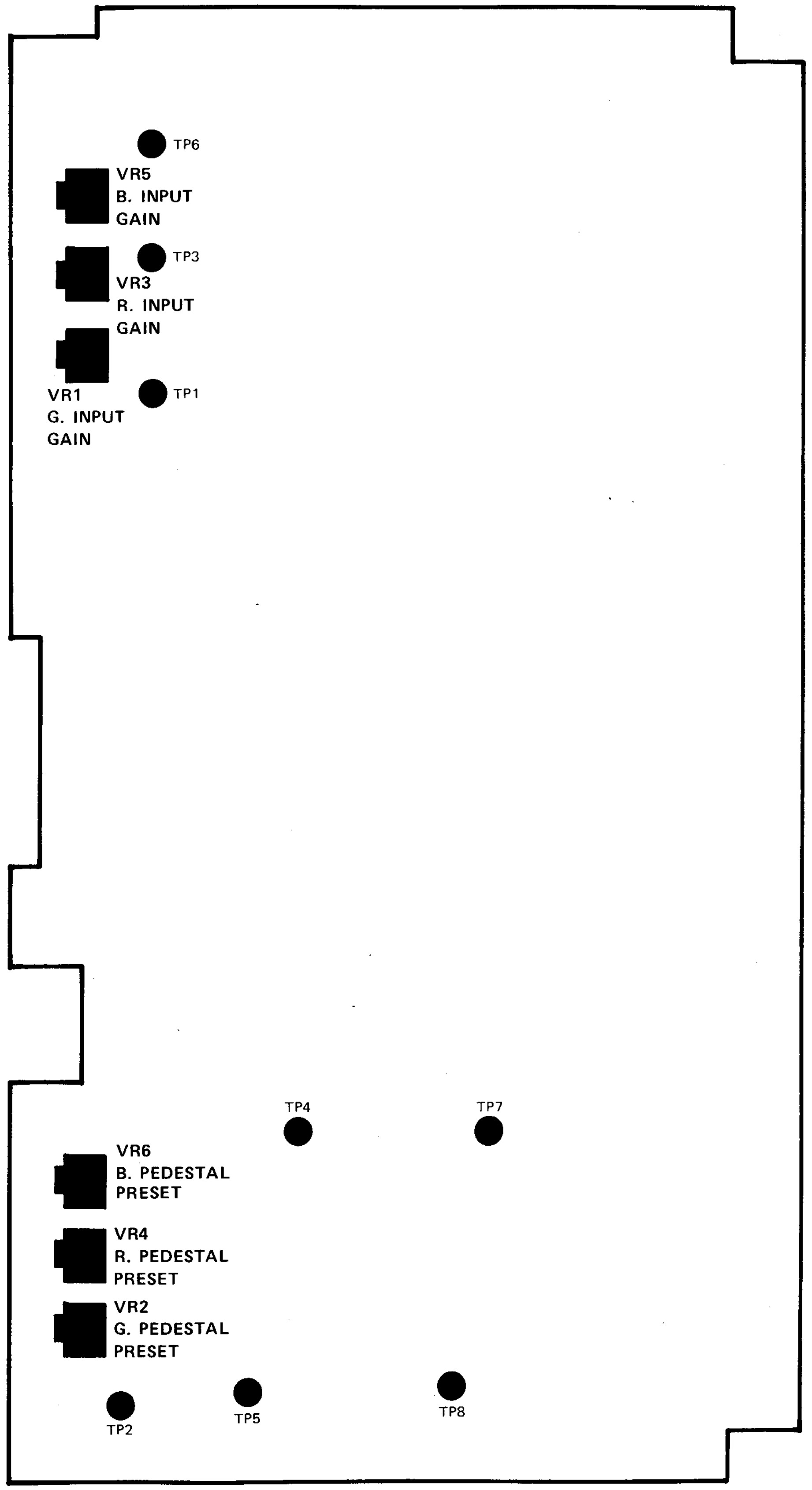
DEFLECTION BOARD and AIC BOARD —Conductor Side—


DEFLECTION BOARD
VR6 B H-ALIGNMENT
VR5 B V-ALIGNMENT
VR4 G H-ALIGNMENT
VR3 G V-ALIGNMENT
L4 B H-SIZE
L3 R H-SIZE
L2 G H-SIZE
VR7 TOTAL H-SIZE
VR23 G H-CENTERING
B BACKFOCUS
B ROTATION
B LOCK
VR12 B H-LIN2
VR10 R H-LIN2
VR8 G H-LIN2
VR13 B H-LIN1
VR11 R H-LIN1
VR9 G H-LIN1
VR18 B V-LIN
VR17 R V-LIN
VR14 TOTAL V-LIN
G LOCK
VR22 G V-CENTERING
VR15 B SKEW
VR16 R SKEW
VR21 B V-SIZE
VR20 R V-SIZE
VR19 TOTAL V-SIZE
OVERSCAN
NORMAL
SW2 H. OVERSCAN SWITCH
SW1 V. OVERSCAN SWITCH
DETAIL
OFF
SW4 DETAIL ON/OFF SWITCH
-G
OFF
SW3 -G ON/OFF SWITCH
R
G
B
SW2 REGISTRATION SWITCH
ENC
REG
AUX
SW1 MONITORING SIGNAL SELECTION SWITCH
G BACKFOCUS
G ROTATION
VR41 B H-CENTERING
VR39 B V-CENTERING
VR42 R H-CENTERING
VR40 R V-CENTERING
VR2 R H-ALIGNMENT
VR1 R V-ALIGNMENT
VR28
VR27
VR26
VR25
VR24
VR33
VR32
VR31
VR30
VR29
VR38
VR37
VR36
VR35
VR34
VR24 B BL OFFSET
VR25 B V-SAWTOOTH
VR26 B V-PARABOLA
VR27 B H-SAWTOOTH
VR28 B H-PARABOLA
VR29 G BL OFFSET
VR30 G V-SAWTOOTH
VR31 G V-PARABOLA
VR32 G H-SAWTOOTH
VR33 G H-PARABOLA
VR34 R BL OFFSET
VR35 R V-SAWTOOTH
VR36 R V-PARABOLA
VR37 R H-SAWTOOTH
VR38 R H-PARABOLA
AIC BOARD
R LOCK
VR1 IRIS SET
R BACKFOCUS
R ROTATION

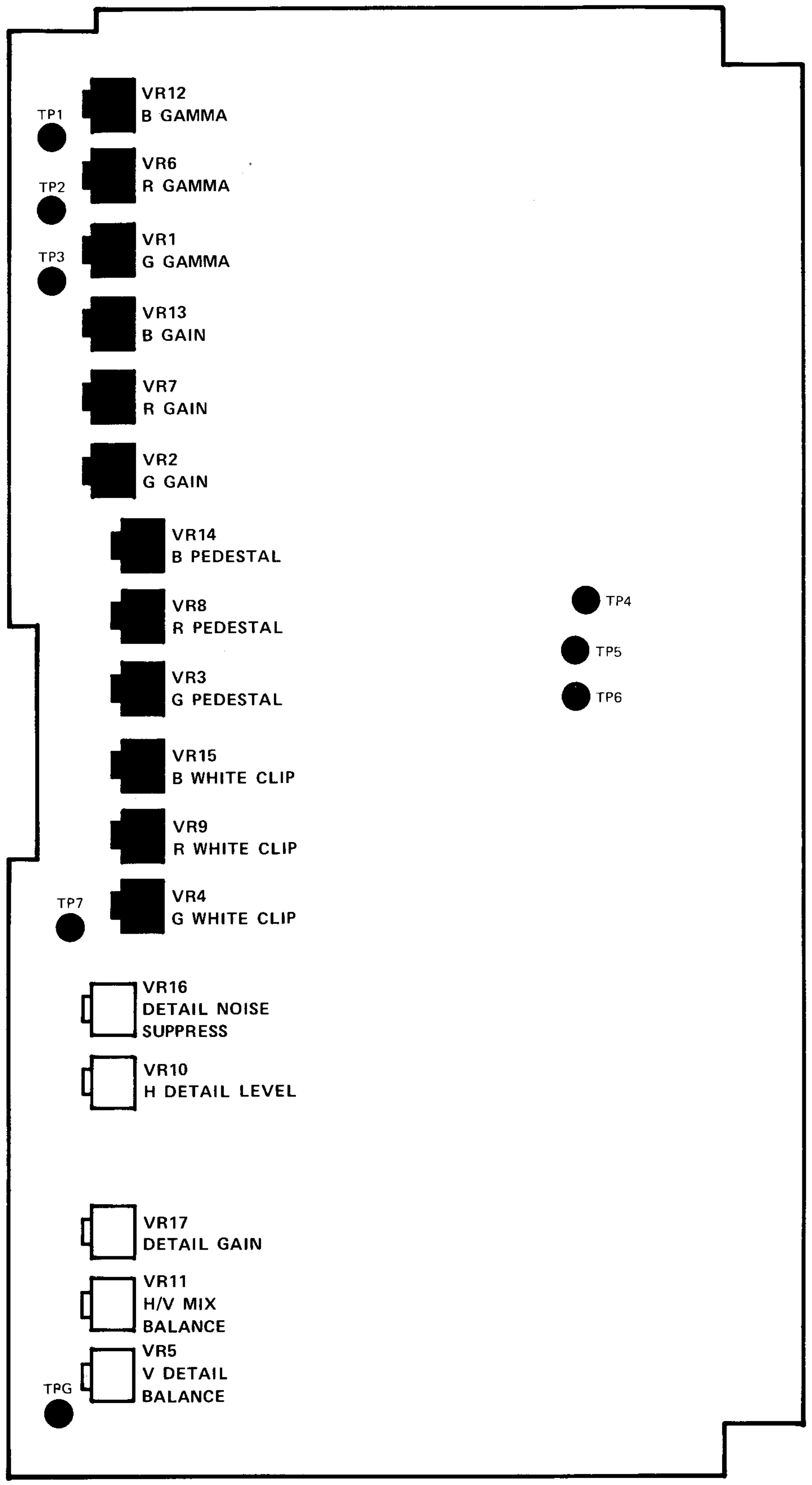
MOTHER BOARD and HIGH VOLTAGE BOARD —Conductor Side—


MOTHER BOARD
TP9
TP10
TP11
TP21
TP13
TP14
TP12
TP15
CH
Y+CH
SW2
Y/CHROMA
SWITCH
TP16
TP17
TP18
TP19
TP20
TP6
TP7
TP8
HIGH VOLTAGE BOARD
TP1
TP4
(GND)
TP2
TP3
VR5
G FOCUS
VR6
R FOCUS
VR4
B FOCUS
VR1
R BEAM
VR2
G BEAM
VR3
B BEAM
VR10
−9V ADJ
VR11
TARGET
VR7
R FBC
LEVEL
VR8
G FBC
LEVEL
VR9
B FBC
LEVEL
TP6
TP5
CN6
1 2 3 4 5 6 7 8 9 10 11 12
VR1
R GAIN
VR7
B GAIN
PRESET
TP1 TP2
VR2
B GAIN
VR6
R GAIN
PRESET
TP3
VR9
B PEDESTAL
PRESET
VR8
R PEDESTAL
PRESET
VR10
TOTAL PEDESTAL
PRESET
TP5 TP4
VR3
R PEDESTAL
VR4
B PEDESTAL
VR5
TOTAL PEDESTAL
SW1
VTR COMPATIBILITY
SWITCH
B
A (PANASONIC)

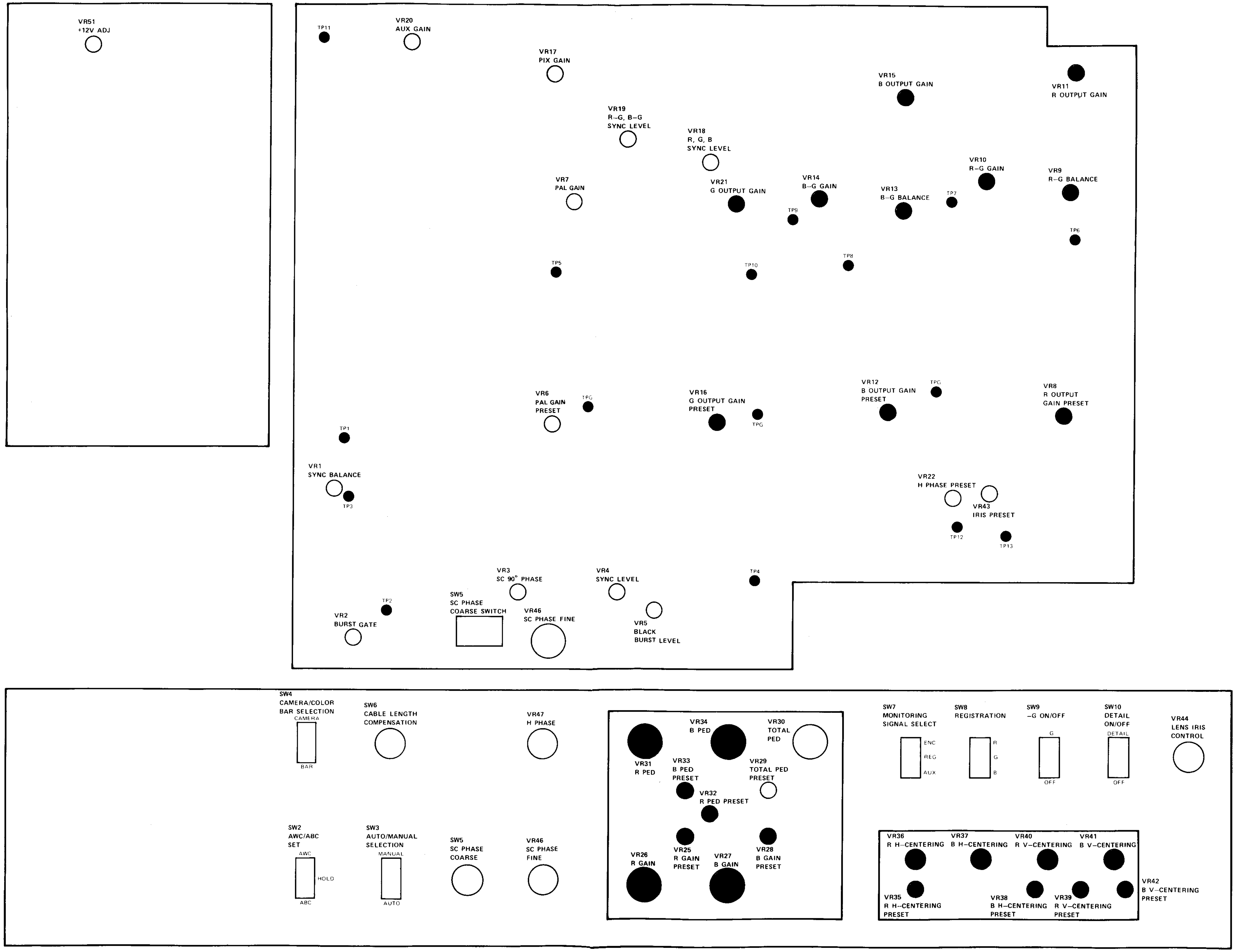
PROCESS-1 BOARD —Component Side—


TP6
VR5
B. INPUT
GAIN
TP3
VR3
R. INPUT
GAIN
VR1
G. INPUT
GAIN
TP1
TP4
TP7
VR6
B. PEDESTAL
PRESET
VR4
R. PEDESTAL
PRESET
VR2
G. PEDESTAL
PRESET
TP2
TP5
TP8

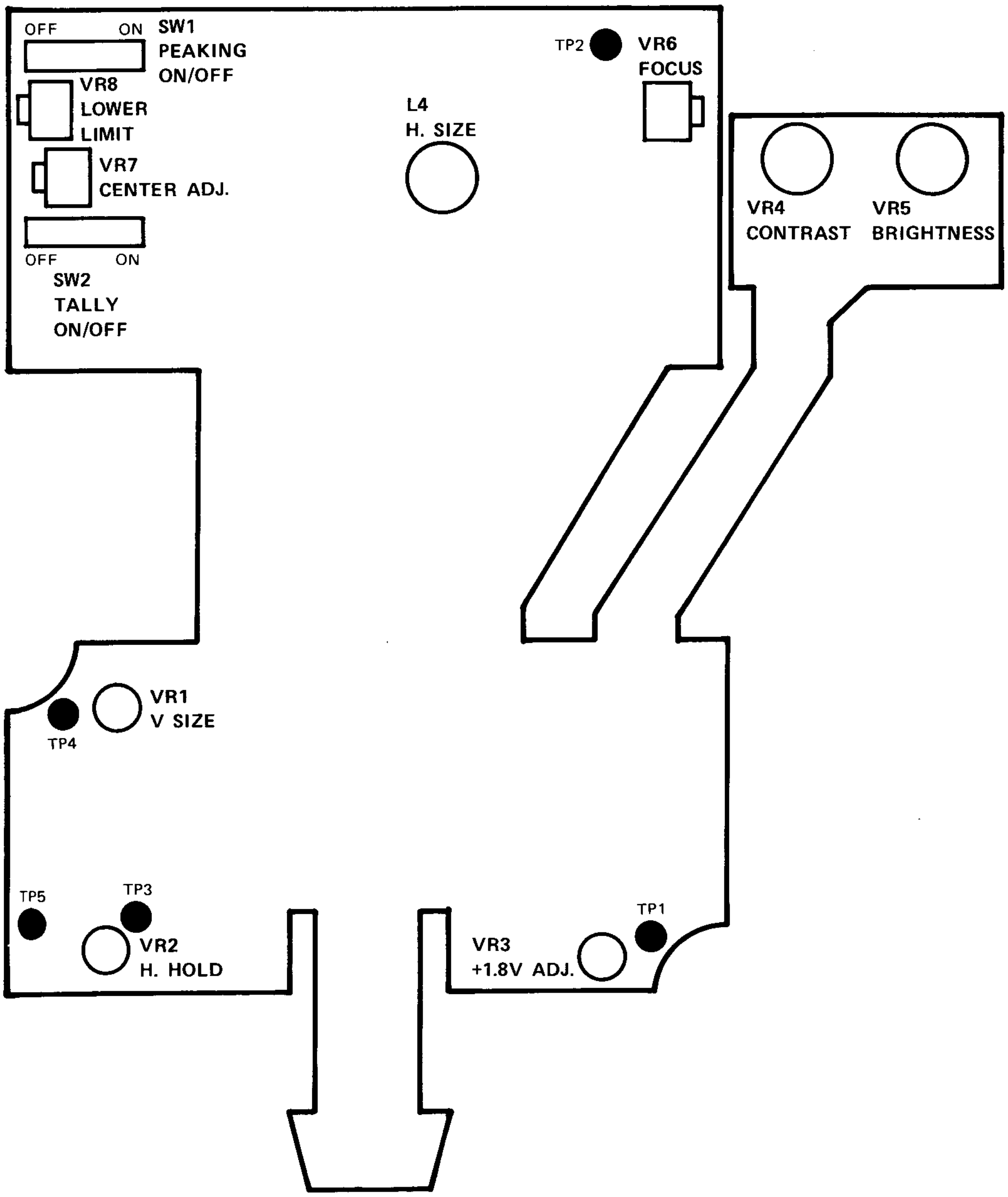
PROCESS-2 BOARD —Component Side—


TP1
VR12
B GAMMA
TP2
VR6
R GAMMA
TP3
VR1
G GAMMA
VR13
B GAIN
VR7
R GAIN
VR2
G GAIN
VR14
B PEDESTAL
VR8
R PEDESTAL
VR3
G PEDESTAL
TP4
TP5
TP6
VR15
B WHITE CLIP
VR9
R WHITE CLIP
TP7
VR4
G WHITE CLIP
VR16
DETAIL NOISE
SUPPRESS
VR10
H DETAIL LEVEL
VR17
DETAIL GAIN
VR11
H/V MIX
BALANCE
TPG
VR5
V DETAIL
BALANCE

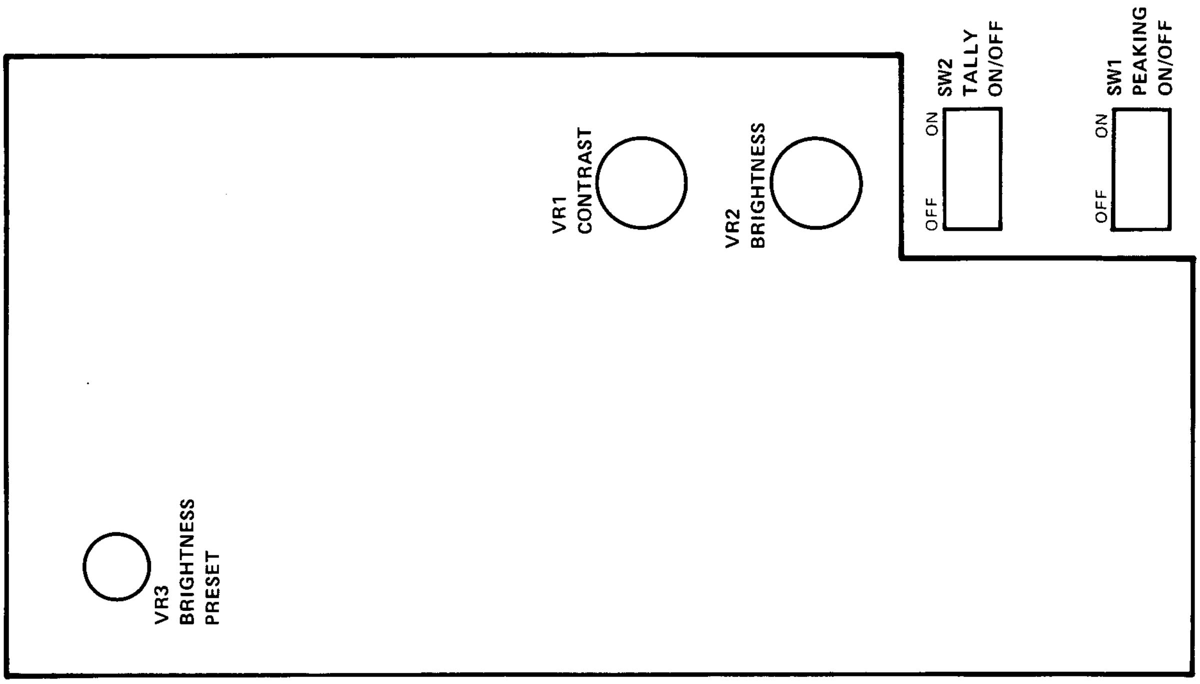
REMOTE CONTROL UNIT (RCU) WV-RC30 —Component Side—

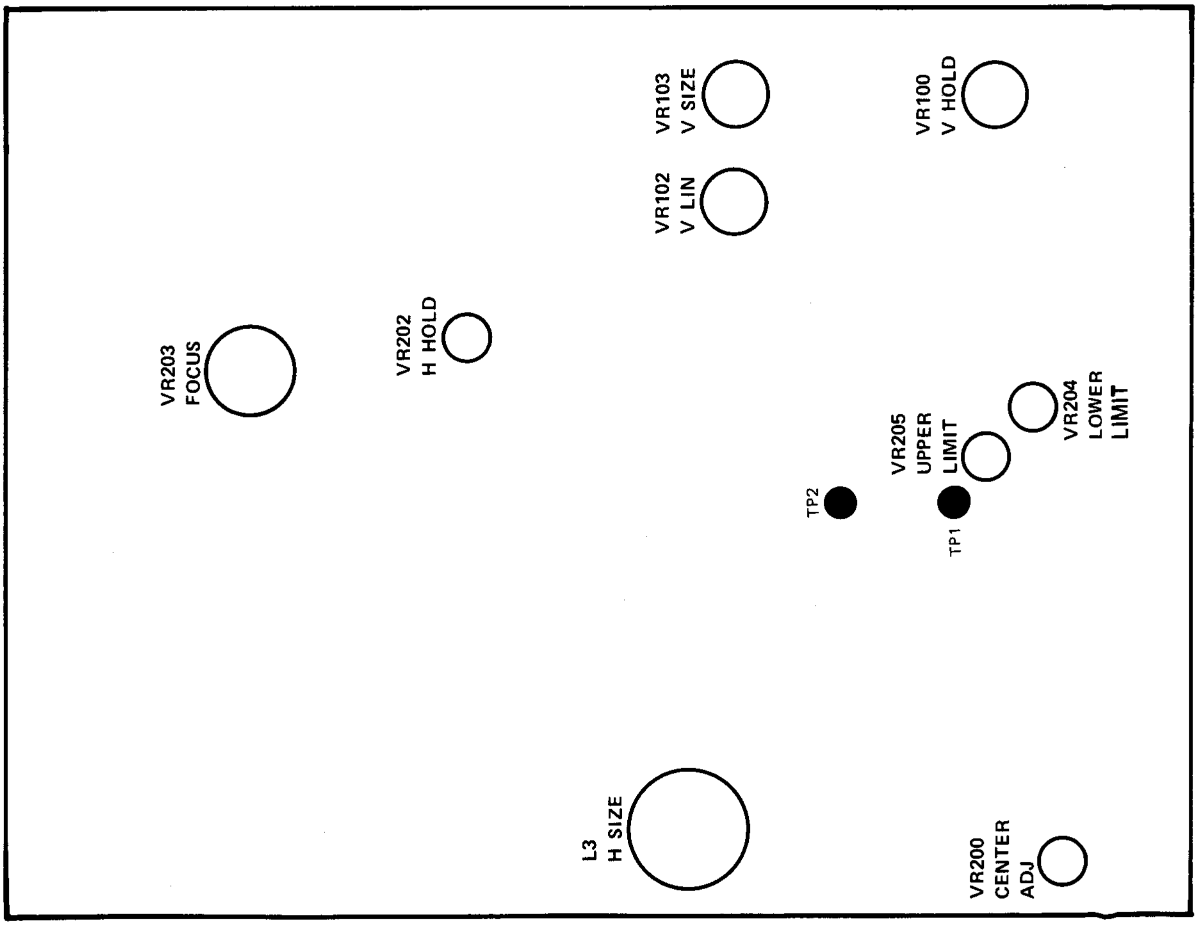

VR51
+12V ADJ
TP11
VR20
AUX GAIN
VR17
PIX GAIN
VR19
R–G, B–G
SYNC LEVEL
VR18
R, G, B
SYNC LEVEL
VR15
B OUTPUT GAIN
VR11
R OUTPUT GAIN
VR10
R–G GAIN
VR9
R–G BALANCE
VR7
PAL GAIN
VR21
G OUTPUT GAIN
VR14
B–G GAIN
VR13
B–G BALANCE
TP7
TP9
TP6
TP5
TP10
TP8
VR12
B OUTPUT GAIN
PRESET
TPG
VR6
PAL GAIN
PRESET
TPG
VR16
G OUTPUT GAIN
PRESET
TPG
VR8
R OUTPUT
GAIN PRESET
TP1
VR1
SYNC BALANCE
TP3
VR22
H PHASE PRESET
VR43
IRIS PRESET
TP12
TP13
VR3
SC 90° PHASE
VR4
SYNC LEVEL
TP4
SW5
SC PHASE
COARSE SWITCH
TP2
VR2
BURST GATE
VR46
SC PHASE FINE
VR5
BLACK
BURST LEVEL
SW4
CAMERA/COLOR
BAR SELECTION
CAMERA
BAR
SW6
CABLE LENGTH
COMPENSATION
VR47
H PHASE
VR34
B PED
VR30
TOTAL
PED
VR31
R PED
VR33
B PED
PRESET
VR29
TOTAL PED
PRESET
VR32
R PED PRESET
SW7
MONITORING
SIGNAL SELECT
ENC
REG
AUX
SW8
REGISTRATION
R
G
B
SW9
–G ON/OFF
G
OFF
SW10
DETAIL
ON/OFF
DETAIL
OFF
VR44
LENS IRIS
CONTROL
SW2
AWC/ABC
SET
AWC
HOLD
ABC
SW3
AUTO/MANUAL
SELECTION
MANUAL
AUTO
SW5
SC PHASE
COARSE
VR46
SC PHASE
FINE
VR26
R GAIN
VR25
R GAIN
PRESET
VR27
B GAIN
VR28
B GAIN
PRESET
VR36
R H–CENTERING
VR37
B H–CENTERING
VR40
R V–CENTERING
VR41
B V–CENTERING
VR35
R H–CENTERING
PRESET
VR38
B H–CENTERING
PRESET
VR39
R V–CENTERING
PRESET
VR42
B V–CENTERING
PRESET

1.5″ VIEWFINDER WV-VF30 —Component Side—


OFF
ON
SW1
PEAKING
ON/OFF
VR8
LOWER
LIMIT
VR7
CENTER ADJ.
OFF
ON
SW2
TALLY
ON/OFF
L4
H. SIZE
TP2
VR6
FOCUS
VR4
CONTRAST
VR5
BRIGHTNESS
VR1
V SIZE
TP4
TP5
TP3
VR2
H. HOLD
VR3
+1.8V ADJ.
TP1

5″ VIEWFINDER WV-VF35 —Component Side—


SW2
TALLY
ON/OFF
ON
OFF
SW1
PEAKING
ON/OFF
ON
OFF
VR1
CONTRAST
VR2
BRIGHTNESS
VR3
BRIGHTNESS
PRESET


VR103
V SIZE
VR100
V HOLD
VR102
V LIN
VR203
FOCUS
VR202
H HOLD
VR204
LOWER
LIMIT
VR205
UPPER
LIMIT
TP2
TP1
L3
H SIZE
VR200
CENTER
ADJ

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Vol. 3

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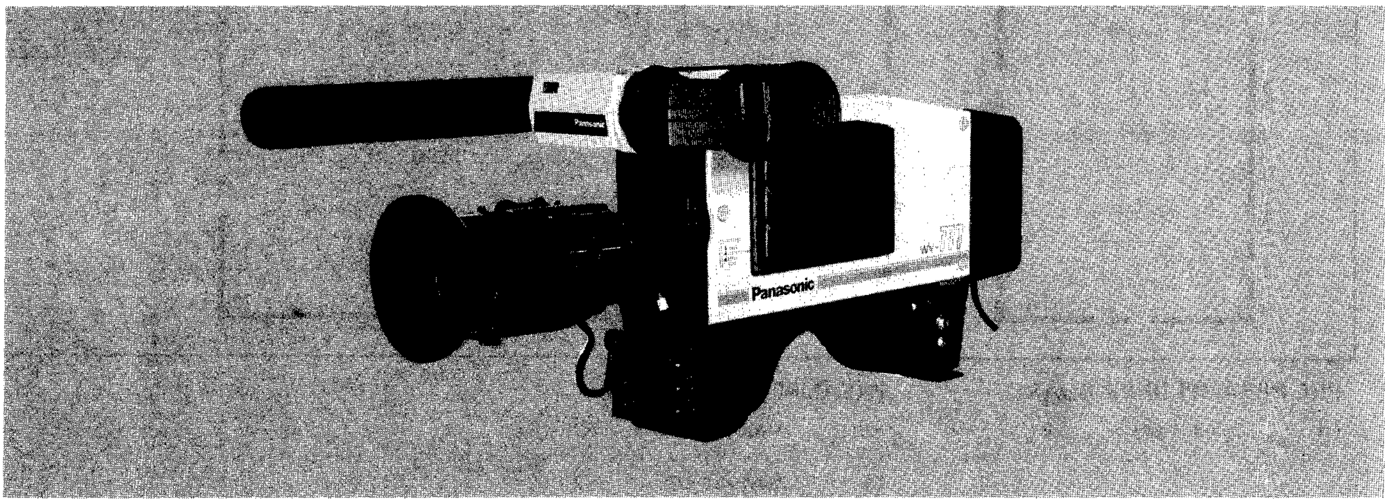
Schematic Diagrams
Conductor Views

Colour Video Camera
WV-777 Series



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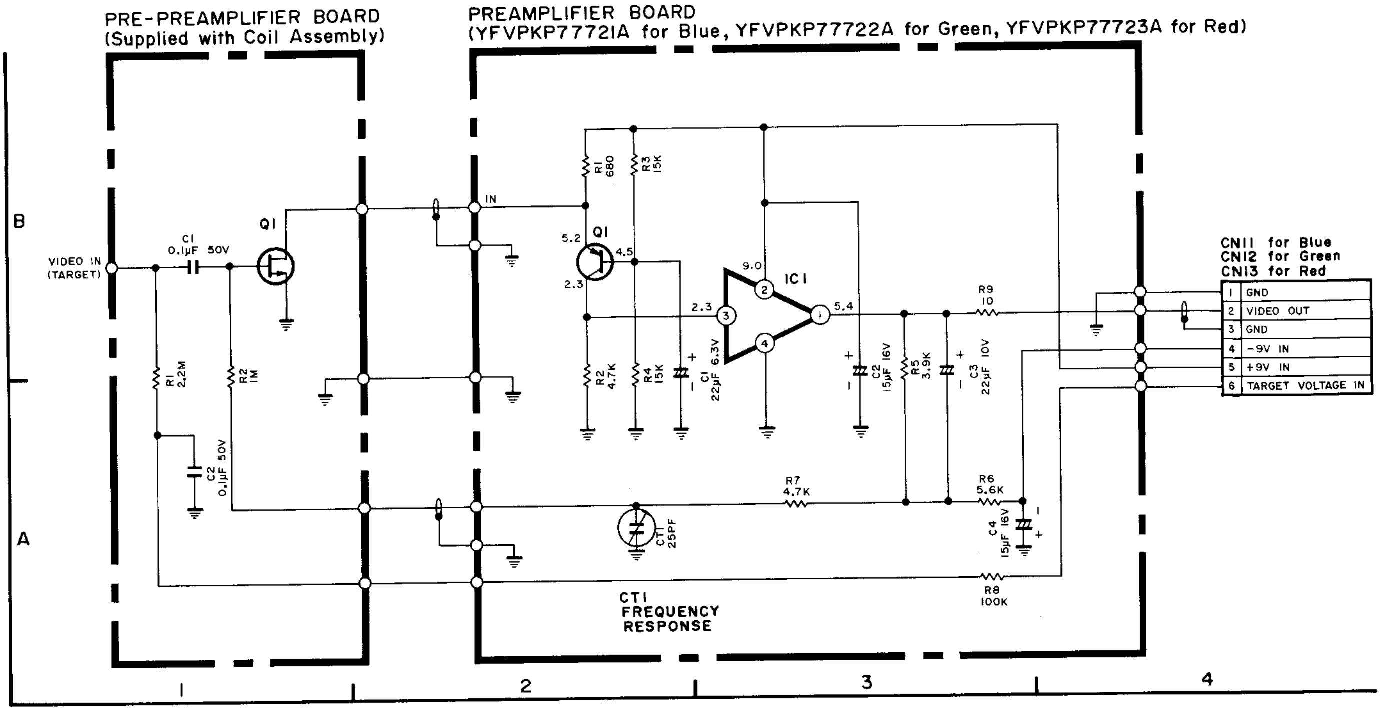
SCHEMATIC DIAGRAM OF PRE-PREAMPLIFIER AND PREAMPLIFIER BOARD


PRE-PREAMPLIFIER BOARD
(Supplied with Coil Assembly)
PREAMPLIFIER BOARD
(YFVPKP77721A for Blue, YFVPKP77722A for Green, YFVPKP77723A for Red)
B
A
VIDEO IN (TARGET)
C1 0.1µF 50V
Q1
R1 2.2M
R2 1M
C2 0.1µF 50V
IN
R1 680
R3 15K
Q1
5.2
4.5
2.3
9.0
IC1
2.3
5.4
R2 4.7K
R4 15K
C1 22µF 6.3V
C2 15µF 16V
R5 3.9K
C3 22µF 10V
R9 10
R7 4.7K
R6 5.6K
C4 15µF 16V
CT1 25PF
R8 100K
CT1 FREQUENCY RESPONSE
CN11 for Blue
CN12 for Green
CN13 for Red
1 GND
2 VIDEO OUT
3 GND
4 -9V IN
5 +9V IN
6 TARGET VOLTAGE IN
1
2
3
4

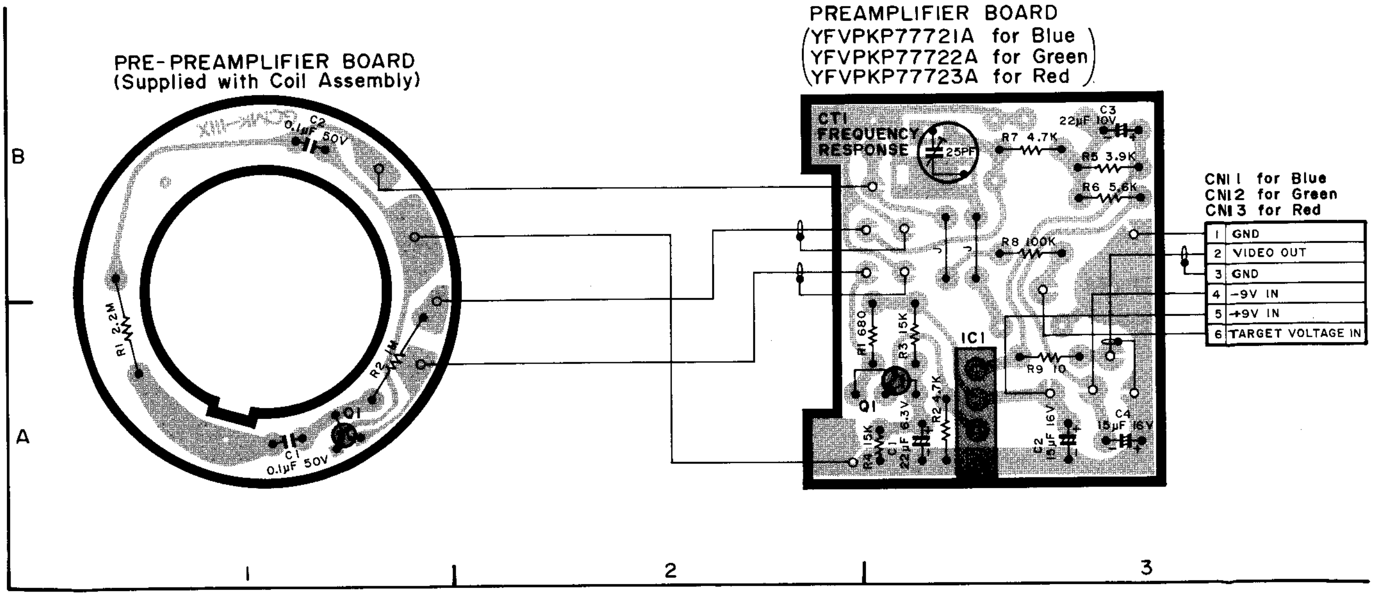
PRE-PREAMPLIFIER BOARD

Q1	2SK321-QR	B1

PREAMPLIFIER BOARD

IC1	AN608P	B3
Q1	2SA1254-BC	B2

CONDUCTOR VIEW OF PRE-PREAMPLIFIER AND PREAMPLIFIER BOARD


PRE-PREAMPLIFIER BOARD
(Supplied with Coil Assembly)
PREAMPLIFIER BOARD
(YFVPKP77721A for Blue
YFVPKP77722A for Green
YFVPKP77723A for Red)
B
A
C2 0.1µF 50V
R1 2.2M
R2 1M
Q1
C1 0.1µF 50V
CT1 FREQUENCY RESPONSE
25PF
C3 22µF 10V
R7 4.7K
R5 3.9K
R6 5.6K
R8 100K
R1 680
R3 15K
IC1
Q1
C1 22µF 6.3V
R2 4.7K
R4 15K
R9 10
C2 15µF 16V
C4 15µF 16V
CN11 for Blue
CN12 for Green
CN13 for Red
1 GND
2 VIDEO OUT
3 GND
4 -9V IN
5 +9V IN
6 TARGET VOLTAGE IN
1
2
3

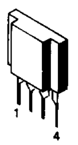
PRE-PREAMPLIFIER BOARD

Q1	2SK321-QR	A1

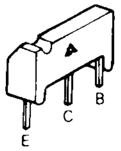
PREAMPLIFIER BOARD

IC1	AN608P	A3
Q1	2SA1254-BC	A2, A3

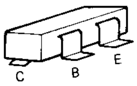
AN608P



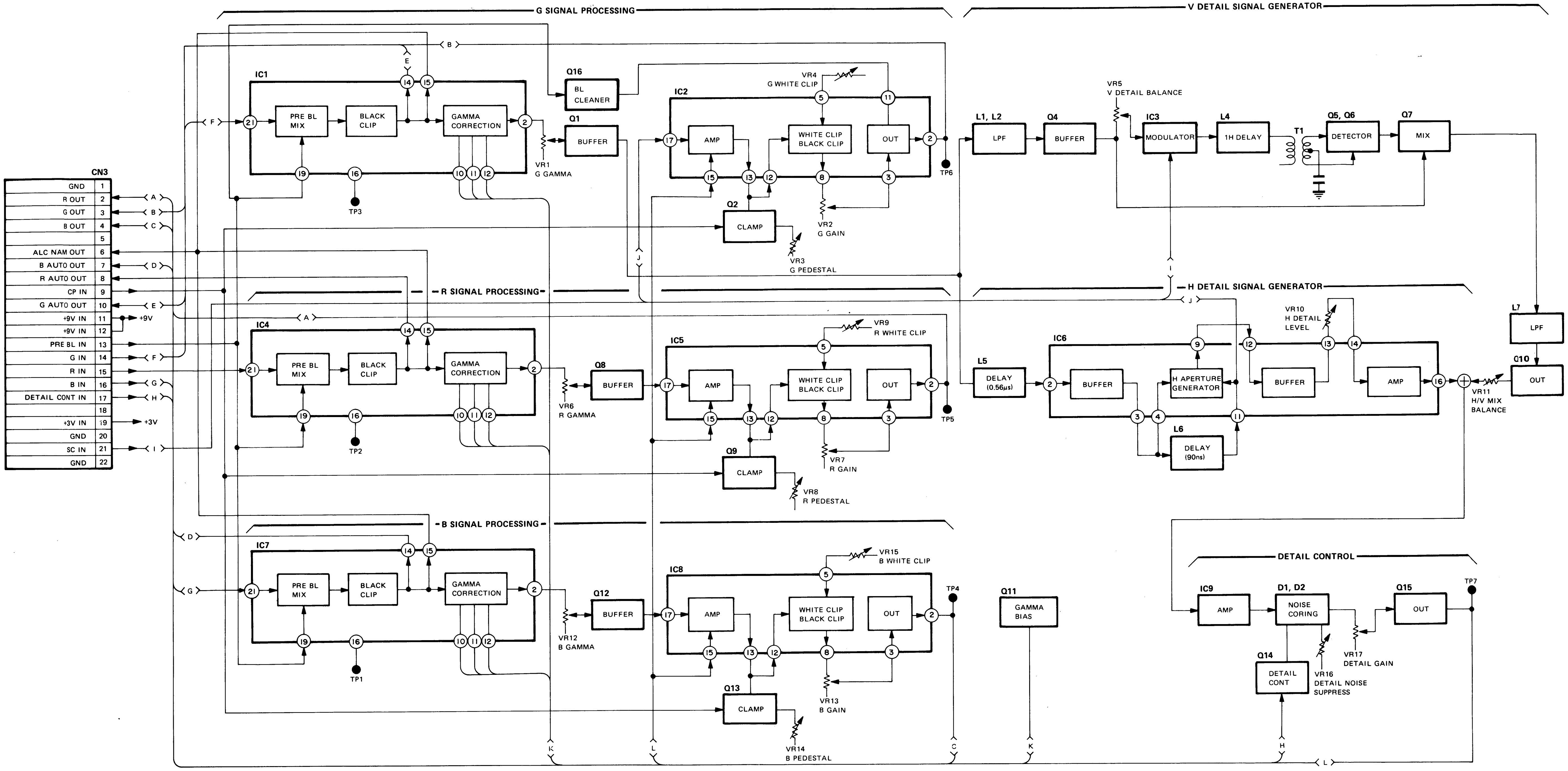
2SA1254-BC



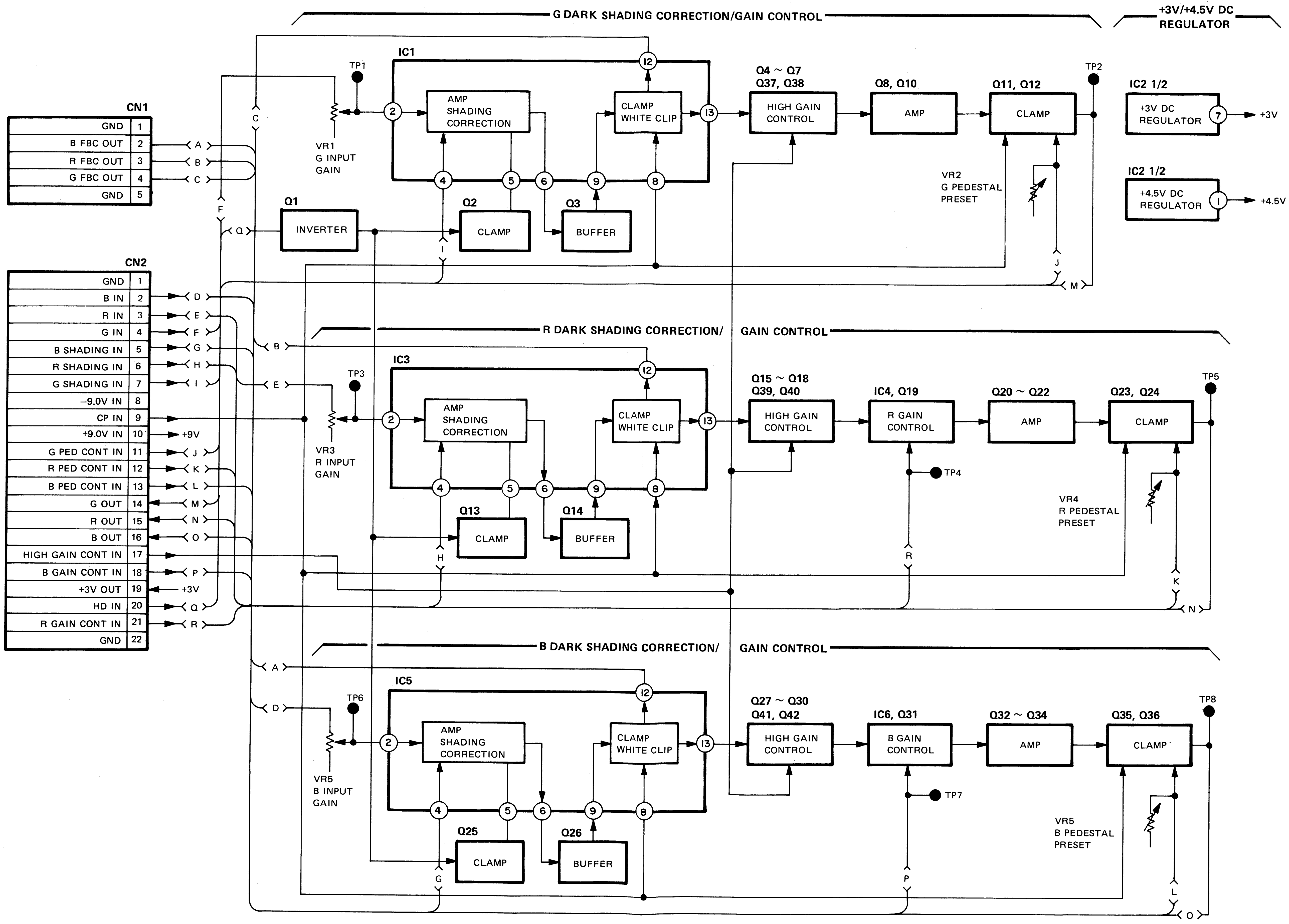
2SK321-QR



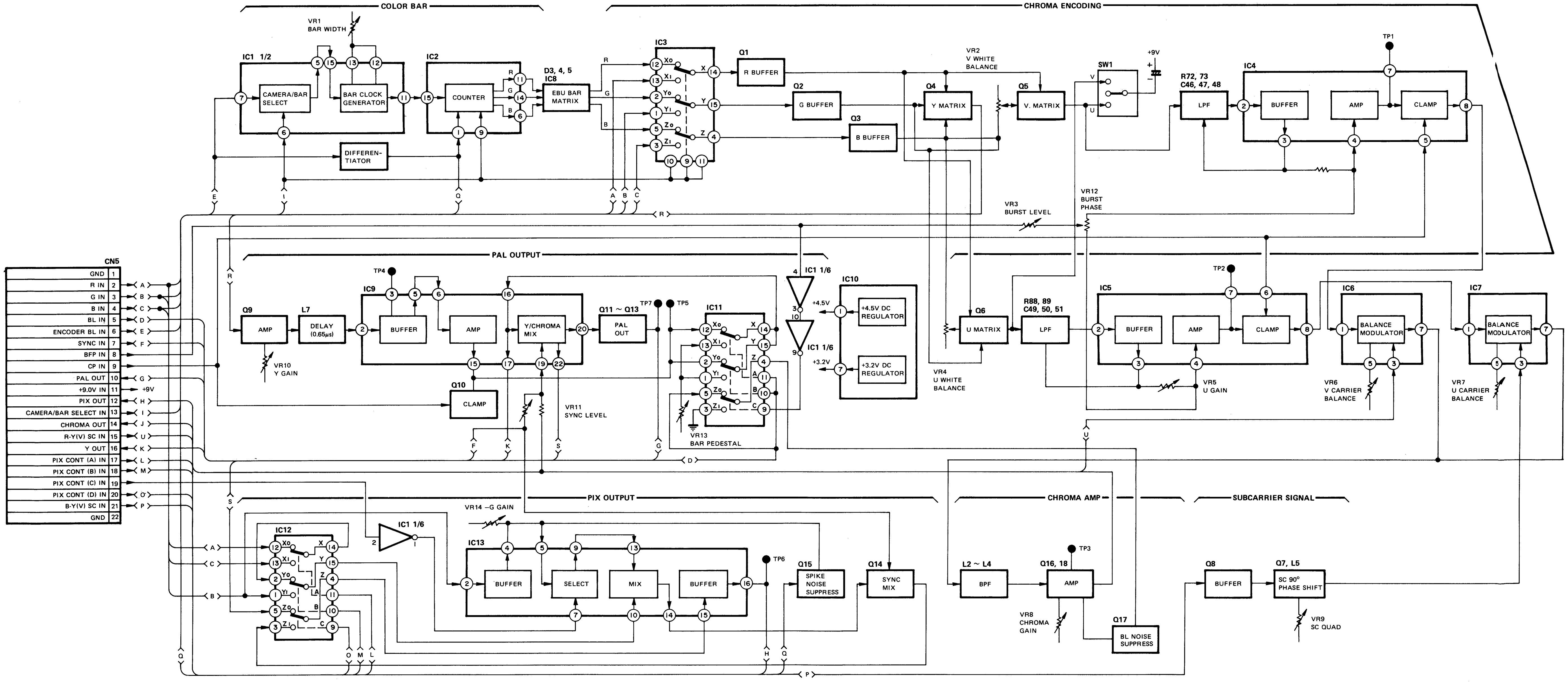
BLOCK DIAGRAM OF PROCESS-2 BOARD


G SIGNAL PROCESSING
V DETAIL SIGNAL GENERATOR
R SIGNAL PROCESSING
H DETAIL SIGNAL GENERATOR
B SIGNAL PROCESSING
DETAIL CONTROL
CN3
GND 1
R OUT 2
G OUT 3
B OUT 4
5
ALC NAM OUT 6
B AUTO OUT 7
R AUTO OUT 8
CP IN 9
G AUTO OUT 10
+9V IN 11
+9V IN 12
PRE BL IN 13
G IN 14
R IN 15
B IN 16
DETAIL CONT IN 17
18
+3V IN 19
GND 20
SC IN 21
GND 22
+9V
+3V
IC1
IC4
IC7
PRE BL MIX
BLACK CLIP
GAMMA CORRECTION
TP3
TP2
TP1
Q16
BL CLEANER
Q1
BUFFER
VR1 G GAMMA
Q8
VR6 R GAMMA
Q12
VR12 B GAMMA
IC2
IC5
IC8
AMP
WHITE CLIP BLACK CLIP
OUT
VR4 G WHITE CLIP
VR9 R WHITE CLIP
VR15 B WHITE CLIP
Q2
Q9
Q13
CLAMP
VR2 G GAIN
VR7 R GAIN
VR13 B GAIN
VR3 G PEDESTAL
VR8 R PEDESTAL
VR14 B PEDESTAL
TP6
TP5
TP4
Q11
GAMMA BIAS
L1, L2
LPF
Q4
BUFFER
VR5 V DETAIL BALANCE
IC3
MODULATOR
L4
1H DELAY
T1
Q5, Q6
DETECTOR
Q7
MIX
L5
DELAY (0.56μs)
IC6
BUFFER
H APERTURE GENERATOR
BUFFER
AMP
VR10 H DETAIL LEVEL
L6
DELAY (90ns)
VR11 H/V MIX BALANCE
L7
LPF
Q10
OUT
IC9
AMP
D1, D2
NOISE CORING
Q15
OUT
TP7
Q14
DETAIL CONT
VR16 DETAIL NOISE SUPPRESS
VR17 DETAIL GAIN
A
B
C
D
E
F
G
H
I
J
K
L

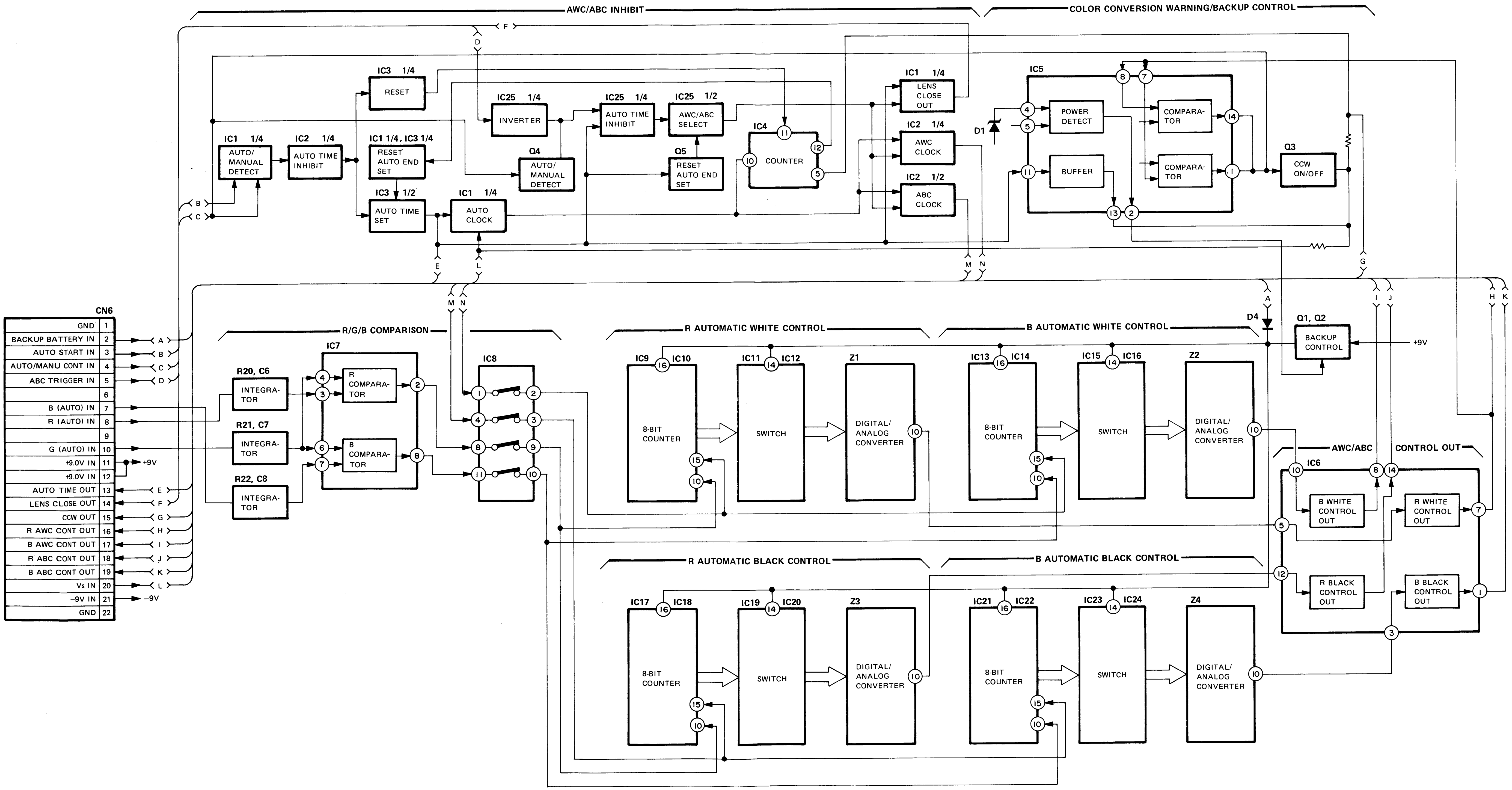
BLOCK DIAGRAM OF PROCESS-1 BOARD


G DARK SHADING CORRECTION/GAIN CONTROL
+3V/+4.5V DC REGULATOR
CN1
GND 1
B FBC OUT 2
R FBC OUT 3
G FBC OUT 4
GND 5
CN2
GND 1
B IN 2
R IN 3
G IN 4
B SHADING IN 5
R SHADING IN 6
G SHADING IN 7
−9.0V IN 8
CP IN 9
+9.0V IN 10
G PED CONT IN 11
R PED CONT IN 12
B PED CONT IN 13
G OUT 14
R OUT 15
B OUT 16
HIGH GAIN CONT IN 17
B GAIN CONT IN 18
+3V OUT 19
HD IN 20
R GAIN CONT IN 21
GND 22
+9V
+3V
TP1
VR1
G INPUT GAIN
IC1
AMP SHADING CORRECTION
CLAMP WHITE CLIP
Q1
INVERTER
Q2
CLAMP
Q3
BUFFER
Q4 ~ Q7
Q37, Q38
HIGH GAIN CONTROL
Q8, Q10
AMP
Q11, Q12
CLAMP
TP2
VR2
G PEDESTAL PRESET
IC2 1/2
+3V DC REGULATOR
+3V
IC2 1/2
+4.5V DC REGULATOR
+4.5V
R DARK SHADING CORRECTION/ GAIN CONTROL
TP3
VR3
R INPUT GAIN
IC3
AMP SHADING CORRECTION
CLAMP WHITE CLIP
Q13
CLAMP
Q14
BUFFER
Q15 ~ Q18
Q39, Q40
HIGH GAIN CONTROL
IC4, Q19
R GAIN CONTROL
TP4
Q20 ~ Q22
AMP
Q23, Q24
CLAMP
TP5
VR4
R PEDESTAL PRESET
B DARK SHADING CORRECTION/ GAIN CONTROL
TP6
VR5
B INPUT GAIN
IC5
AMP SHADING CORRECTION
CLAMP WHITE CLIP
Q25
CLAMP
Q26
BUFFER
Q27 ~ Q30
Q41, Q42
HIGH GAIN CONTROL
IC6, Q31
B GAIN CONTROL
TP7
Q32 ~ Q34
AMP
Q35, Q36
CLAMP
TP8
VR5
B PEDESTAL PRESET
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
②
④
⑤
⑥
⑧
⑨
⑫
⑬
⑦
①

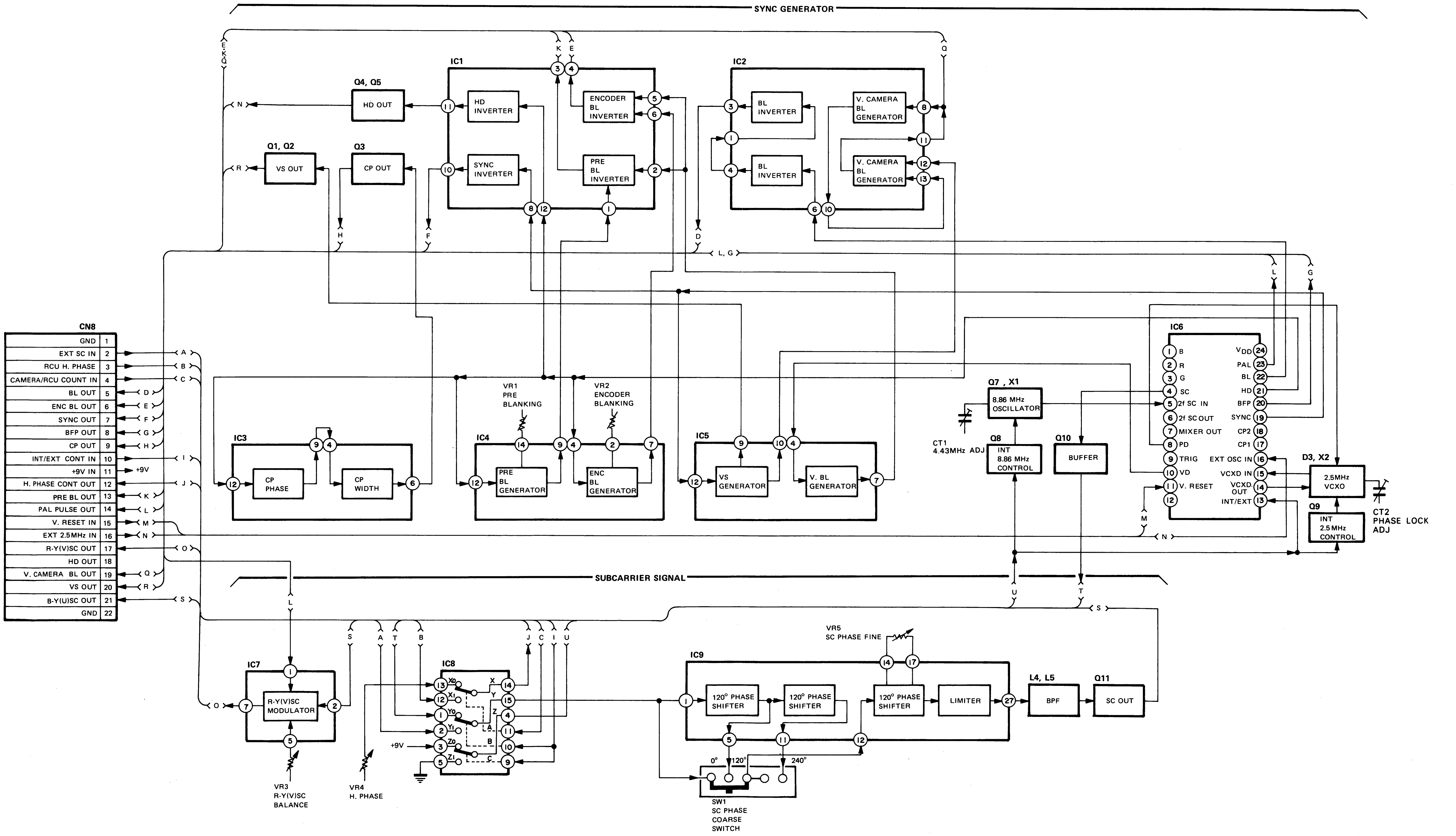
BLOCK DIAGRAM OF ENCODER BOARD


COLOR BAR
CHROMA ENCODING
VR1
BAR WIDTH
IC1 1/2
CAMERA/BAR SELECT
BAR CLOCK GENERATOR
IC2
COUNTER
DIFFEREN-TIATOR
D3, 4, 5
IC8
EBU BAR MATRIX
IC3
Q1
R BUFFER
Q2
G BUFFER
Q3
B BUFFER
VR2
V WHITE BALANCE
Q4
Y MATRIX
Q5
V. MATRIX
SW1
+9V
R72, 73
C46, 47, 48
LPF
IC4
BUFFER
AMP
CLAMP
TP1
VR3
BURST LEVEL
VR12
BURST PHASE
CN5
GND 1
R IN 2
G IN 3
B IN 4
BL IN 5
ENCODER BL IN 6
SYNC IN 7
BFP IN 8
CP IN 9
PAL OUT 10
+9.0V IN 11
PIX OUT 12
CAMERA/BAR SELECT IN 13
CHROMA OUT 14
R-Y(V) SC IN 15
Y OUT 16
PIX CONT (A) IN 17
PIX CONT (B) IN 18
PIX CONT (C) IN 19
PIX CONT (D) IN 20
B-Y(V) SC IN 21
GND 22
PAL OUTPUT
TP4
IC9
Q9
AMP
L7
DELAY (0.65μs)
BUFFER
AMP
Y/CHROMA MIX
VR10
Y GAIN
Q10
CLAMP
VR11
SYNC LEVEL
Q11 ~ Q13
PAL OUT
TP7
TP5
IC11
VR13
BAR PEDESTAL
IC1 1/6
IC10
+4.5V
+4.5V DC REGULATOR
+3.2V
+3.2V DC REGULATOR
VR4
U WHITE BALANCE
Q6
U MATRIX
R88, 89
C49, 50, 51
LPF
TP2
IC5
BUFFER
AMP
CLAMP
VR5
U GAIN
IC6
BALANCE MODULATOR
VR6
V CARRIER BALANCE
IC7
BALANCE MODULATOR
VR7
U CARRIER BALANCE
PIX OUTPUT
IC12
IC1 1/6
VR14 –G GAIN
IC13
BUFFER
SELECT
MIX
BUFFER
TP6
Q15
SPIKE NOISE SUPPRESS
Q14
SYNC MIX
CHROMA AMP
L2 ~ L4
BPF
Q16, 18
AMP
TP3
VR8
CHROMA GAIN
Q17
BL NOISE SUPPRESS
SUBCARRIER SIGNAL
Q8
BUFFER
Q7, L5
SC 90° PHASE SHIFT
VR9
SC QUAD

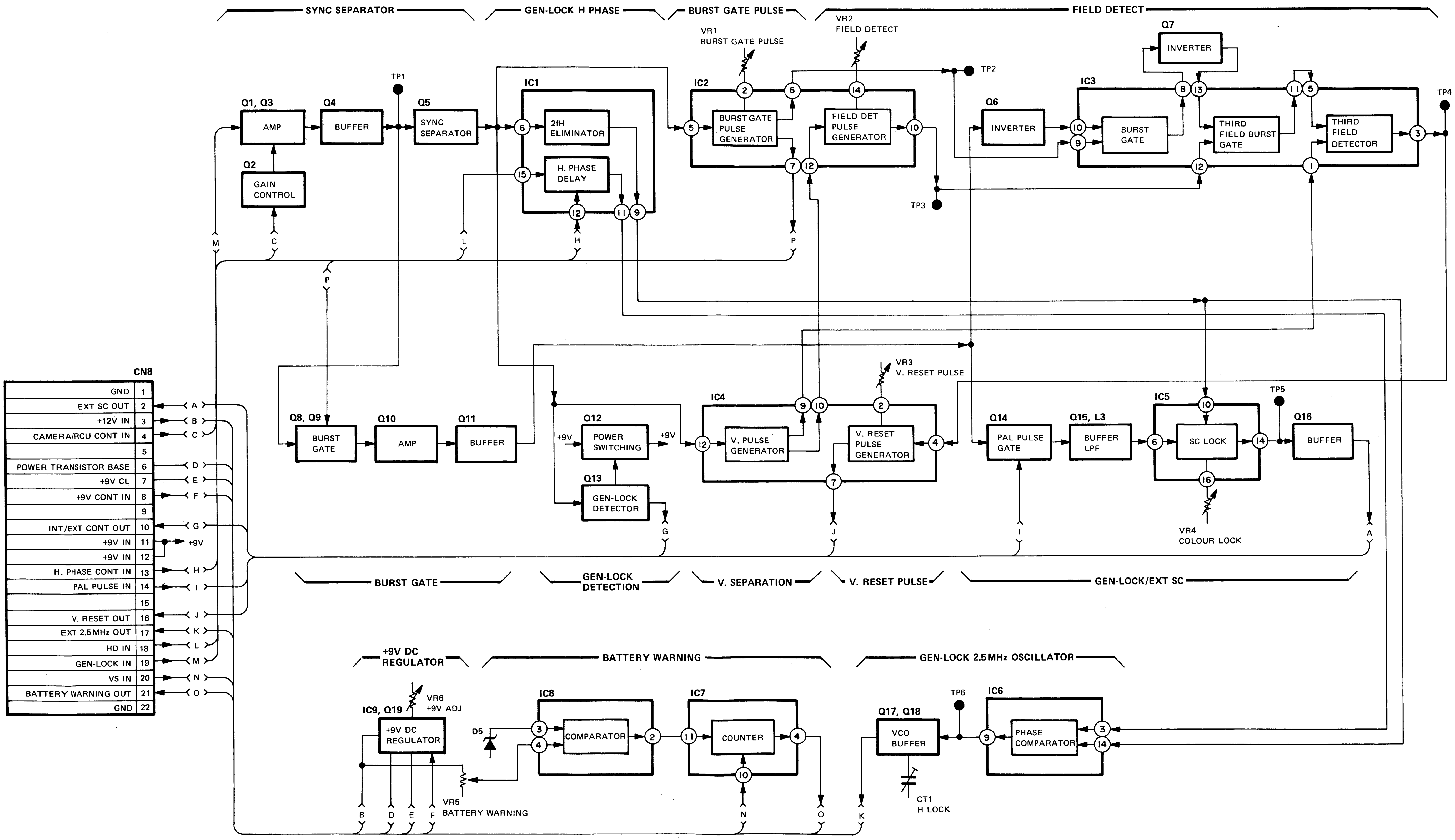
BLOCK DIAGRAM OF AUTO BOARD


AWC/ABC INHIBIT
COLOR CONVERSION WARNING/BACKUP CONTROL
F
D
IC3 1/4
RESET
IC25 1/4
INVERTER
IC25 1/4
AUTO TIME INHIBIT
IC25 1/2
AWC/ABC SELECT
IC1 1/4
LENS CLOSE OUT
IC5
IC1 1/4
AUTO/MANUAL DETECT
IC2 1/4
AUTO TIME INHIBIT
IC1 1/4, IC3 1/4
RESET AUTO END SET
Q4
AUTO/MANUAL DETECT
Q5
RESET AUTO END SET
IC4
COUNTER
IC2 1/4
AWC CLOCK
IC2 1/2
ABC CLOCK
D1
POWER DETECT
BUFFER
COMPARA-TOR
COMPARA-TOR
Q3
CCW ON/OFF
IC3 1/2
AUTO TIME SET
IC1 1/4
AUTO CLOCK
B
C
E
L
M
N
G
CN6
GND 1
BACKUP BATTERY IN 2
AUTO START IN 3
AUTO/MANU CONT IN 4
ABC TRIGGER IN 5
6
B (AUTO) IN 7
R (AUTO) IN 8
9
G (AUTO) IN 10
+9.0V IN 11
+9.0V IN 12
AUTO TIME OUT 13
LENS CLOSE OUT 14
CCW OUT 15
R AWC CONT OUT 16
B AWC CONT OUT 17
R ABC CONT OUT 18
B ABC CONT OUT 19
Vs IN 20
−9V IN 21
GND 22
+9V
−9V
A
B
C
D
E
F
G
H
I
J
K
L
R/G/B COMPARISON
IC7
R20, C6
INTEGRA-TOR
R21, C7
INTEGRA-TOR
R22, C8
INTEGRA-TOR
R COMPARA-TOR
B COMPARA-TOR
IC8
R AUTOMATIC WHITE CONTROL
B AUTOMATIC WHITE CONTROL
IC9 IC10
8-BIT COUNTER
IC11 IC12
SWITCH
Z1
DIGITAL/ANALOG CONVERTER
IC13 IC14
8-BIT COUNTER
IC15 IC16
SWITCH
Z2
DIGITAL/ANALOG CONVERTER
D4
Q1, Q2
BACKUP CONTROL
+9V
AWC/ABC
CONTROL OUT
IC6
B WHITE CONTROL OUT
R WHITE CONTROL OUT
R BLACK CONTROL OUT
B BLACK CONTROL OUT
R AUTOMATIC BLACK CONTROL
B AUTOMATIC BLACK CONTROL
IC17 IC18
8-BIT COUNTER
IC19 IC20
SWITCH
Z3
DIGITAL/ANALOG CONVERTER
IC21 IC22
8-BIT COUNTER
IC23 IC24
SWITCH
Z4
DIGITAL/ANALOG CONVERTER

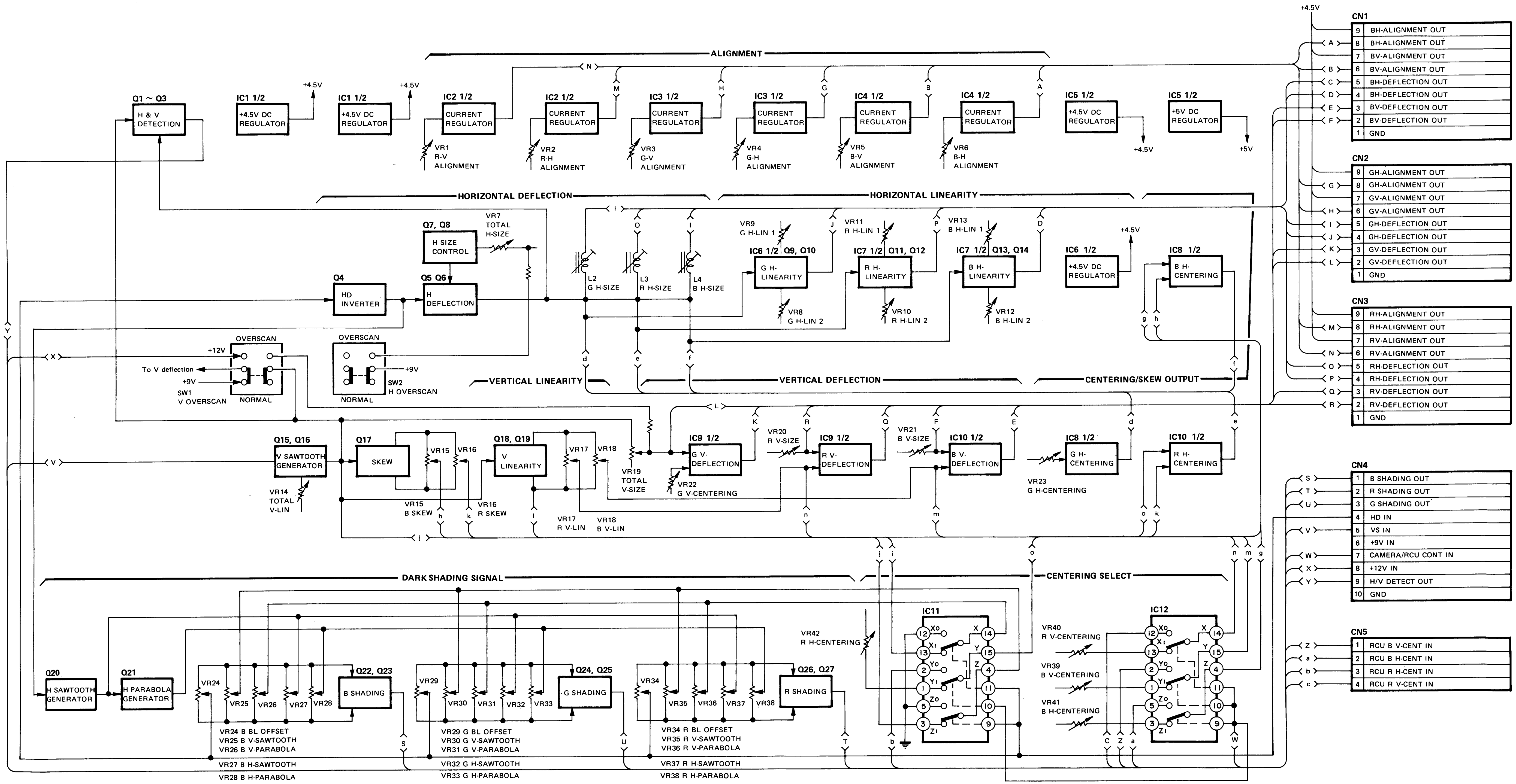
BLOCK DIAGRAM OF SYNC-1 BOARD


SYNC GENERATOR
IC1
HD INVERTER
ENCODER BL INVERTER
SYNC INVERTER
PRE BL INVERTER
IC2
BL INVERTER
V. CAMERA BL GENERATOR
Q4, Q5
HD OUT
Q1, Q2
VS OUT
Q3
CP OUT
CN8
GND 1
EXT SC IN 2
RCU H. PHASE 3
CAMERA/RCU COUNT IN 4
BL OUT 5
ENC BL OUT 6
SYNC OUT 7
BFP OUT 8
CP OUT 9
INT/EXT CONT IN 10
+9V IN 11
H. PHASE CONT OUT 12
PRE BL OUT 13
PAL PULSE OUT 14
V. RESET IN 15
EXT 2.5MHz IN 16
R-Y(V)SC OUT 17
HD OUT 18
V. CAMERA BL OUT 19
VS OUT 20
B-Y(U)SC OUT 21
GND 22
+9V
IC3
CP PHASE
CP WIDTH
VR1 PRE BLANKING
VR2 ENCODER BLANKING
IC4
PRE BL GENERATOR
ENC BL GENERATOR
IC5
VS GENERATOR
V. BL GENERATOR
Q7, X1
8.86 MHz OSCILLATOR
CT1 4.43MHz ADJ
Q8
INT 8.86 MHz CONTROL
Q10
BUFFER
IC6
B
R
G
SC
2f SC IN
2f SC OUT
MIXER OUT
PD
TRIG
VD
V. RESET
VDD
PAL
BL
HD
BFP
SYNC
CP2
CP1
EXT OSC IN
VCXD IN
VCXD OUT
INT/EXT
D3, X2
2.5MHz VCXO
Q9
INT 2.5MHz CONTROL
CT2 PHASE LOCK ADJ
SUBCARRIER SIGNAL
IC7
R-Y(V)SC MODULATOR
VR3 R-Y(V)SC BALANCE
VR4 H. PHASE
IC8
IC9
VR5 SC PHASE FINE
120° PHASE SHIFTER
LIMITER
0° 120° 240°
SW1 SC PHASE COARSE SWITCH
L4, L5
BPF
Q11
SC OUT

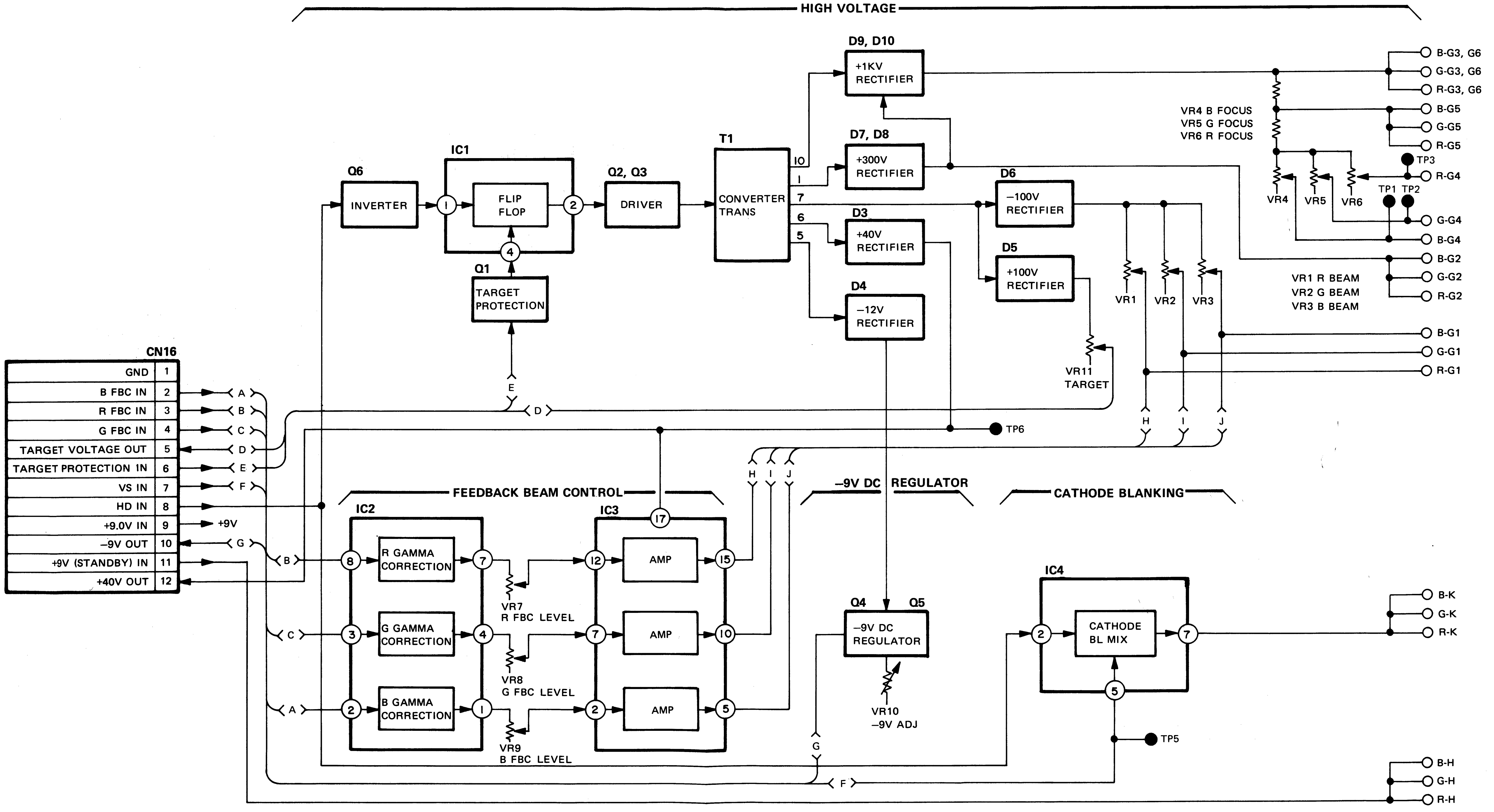
BLOCK DIAGRAM OF SYNC-2 BOARD


SYNC SEPARATOR
GEN-LOCK H PHASE
BURST GATE PULSE
FIELD DETECT
Q1, Q3
AMP
Q4
BUFFER
TP1
Q5
SYNC SEPARATOR
Q2
GAIN CONTROL
IC1
2fH ELIMINATOR
H. PHASE DELAY
VR1
BURST GATE PULSE
IC2
BURST GATE PULSE GENERATOR
VR2
FIELD DETECT
FIELD DET PULSE GENERATOR
TP2
TP3
Q6
INVERTER
Q7
INVERTER
IC3
BURST GATE
THIRD FIELD BURST GATE
THIRD FIELD DETECTOR
TP4
CN8
GND
EXT SC OUT
+12V IN
CAMERA/RCU CONT IN
POWER TRANSISTOR BASE
+9V CL
+9V CONT IN
INT/EXT CONT OUT
+9V IN
+9V IN
H. PHASE CONT IN
PAL PULSE IN
V. RESET OUT
EXT 2.5MHz OUT
HD IN
GEN-LOCK IN
VS IN
BATTERY WARNING OUT
GND
+9V
Q8, Q9
BURST GATE
Q10
AMP
Q11
BUFFER
Q12
POWER SWITCHING
+9V
+9V
Q13
GEN-LOCK DETECTOR
IC4
V. PULSE GENERATOR
VR3
V. RESET PULSE
V. RESET PULSE GENERATOR
Q14
PAL PULSE GATE
Q15, L3
BUFFER LPF
IC5
SC LOCK
TP5
VR4
COLOUR LOCK
Q16
BUFFER
BURST GATE
GEN-LOCK DETECTION
V. SEPARATION
V. RESET PULSE
GEN-LOCK/EXT SC
+9V DC REGULATOR
BATTERY WARNING
GEN-LOCK 2.5MHz OSCILLATOR
IC9, Q19
+9V DC REGULATOR
VR6
+9V ADJ
D5
VR5
BATTERY WARNING
IC8
COMPARATOR
IC7
COUNTER
Q17, Q18
VCO BUFFER
TP6
CT1
H LOCK
IC6
PHASE COMPARATOR

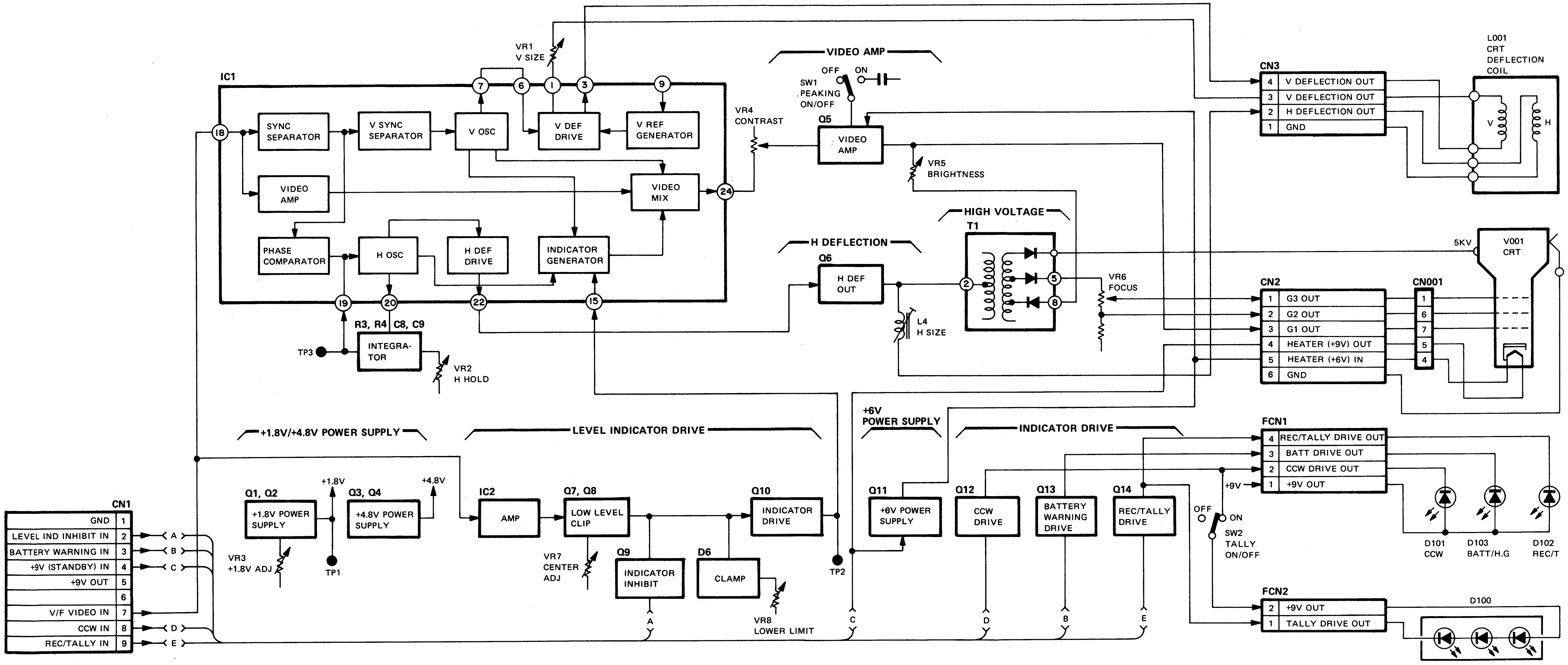
BLOCK DIAGRAM OF DEFLECTION BOARD


ALIGNMENT
HORIZONTAL DEFLECTION
HORIZONTAL LINEARITY
VERTICAL LINEARITY
VERTICAL DEFLECTION
CENTERING/SKEW OUTPUT
DARK SHADING SIGNAL
CENTERING SELECT
Q1 ~ Q3
H & V DETECTION
IC1 1/2
+4.5V DC REGULATOR
+4.5V
IC2 1/2
CURRENT REGULATOR
VR1 R-V ALIGNMENT
VR2 R-H ALIGNMENT
IC3 1/2
VR3 G-V ALIGNMENT
VR4 G-H ALIGNMENT
IC4 1/2
VR5 B-V ALIGNMENT
VR6 B-H ALIGNMENT
IC5 1/2
+5V DC REGULATOR
+5V
Q7, Q8
H SIZE CONTROL
VR7 TOTAL H-SIZE
Q4
HD INVERTER
Q5 Q6
H DEFLECTION
L2 G H-SIZE
L3 R H-SIZE
L4 B H-SIZE
VR9 G H-LIN 1
VR11 R H-LIN 1
VR13 B H-LIN 1
IC6 1/2 Q9, Q10
G H-LINEARITY
IC7 1/2 Q11, Q12
R H-LINEARITY
IC7 1/2 Q13, Q14
B H-LINEARITY
VR8 G H-LIN 2
VR10 R H-LIN 2
VR12 B H-LIN 2
IC6 1/2
+4.5V DC REGULATOR
IC8 1/2
B H-CENTERING
OVERSCAN
+12V
To V deflection
+9V
SW1 V OVERSCAN
NORMAL
SW2 H OVERSCAN
Q15, Q16
V SAWTOOTH GENERATOR
VR14 TOTAL V-LIN
Q17
SKEW
VR15 B SKEW
VR16 R SKEW
Q18, Q19
V LINEARITY
VR17 R V-LIN
VR18 B V-LIN
VR19 TOTAL V-SIZE
IC9 1/2
G V-DEFLECTION
VR22 G V-CENTERING
VR20 R V-SIZE
R V-DEFLECTION
VR21 B V-SIZE
IC10 1/2
B V-DEFLECTION
G H-CENTERING
VR23 G H-CENTERING
R H-CENTERING
Q20
H SAWTOOTH GENERATOR
Q21
H PARABOLA GENERATOR
Q22, Q23
B SHADING
Q24, Q25
G SHADING
Q26, Q27
R SHADING
VR24 B BL OFFSET
VR25 B V-SAWTOOTH
VR26 B V-PARABOLA
VR27 B H-SAWTOOTH
VR28 B H-PARABOLA
VR29 G BL OFFSET
VR30 G V-SAWTOOTH
VR31 G V-PARABOLA
VR32 G H-SAWTOOTH
VR33 G H-PARABOLA
VR34 R BL OFFSET
VR35 R V-SAWTOOTH
VR36 R V-PARABOLA
VR37 R H-SAWTOOTH
VR38 R H-PARABOLA
VR42 R H-CENTERING
IC11
IC12
VR40 R V-CENTERING
VR39 B V-CENTERING
VR41 B H-CENTERING
CN1
9 BH-ALIGNMENT OUT
8 BH-ALIGNMENT OUT
7 BV-ALIGNMENT OUT
6 BV-ALIGNMENT OUT
5 BH-DEFLECTION OUT
4 BH-DEFLECTION OUT
3 BV-DEFLECTION OUT
2 BV-DEFLECTION OUT
1 GND
CN2
9 GH-ALIGNMENT OUT
8 GH-ALIGNMENT OUT
7 GV-ALIGNMENT OUT
6 GV-ALIGNMENT OUT
5 GH-DEFLECTION OUT
4 GH-DEFLECTION OUT
3 GV-DEFLECTION OUT
2 GV-DEFLECTION OUT
1 GND
CN3
9 RH-ALIGNMENT OUT
8 RH-ALIGNMENT OUT
7 RV-ALIGNMENT OUT
6 RV-ALIGNMENT OUT
5 RH-DEFLECTION OUT
4 RH-DEFLECTION OUT
3 RV-DEFLECTION OUT
2 RV-DEFLECTION OUT
1 GND
CN4
1 B SHADING OUT
2 R SHADING OUT
3 G SHADING OUT
4 HD IN
5 VS IN
6 +9V IN
7 CAMERA/RCU CONT IN
8 +12V IN
9 H/V DETECT OUT
10 GND
CN5
1 RCU B V-CENT IN
2 RCU B H-CENT IN
3 RCU R H-CENT IN
4 RCU R V-CENT IN

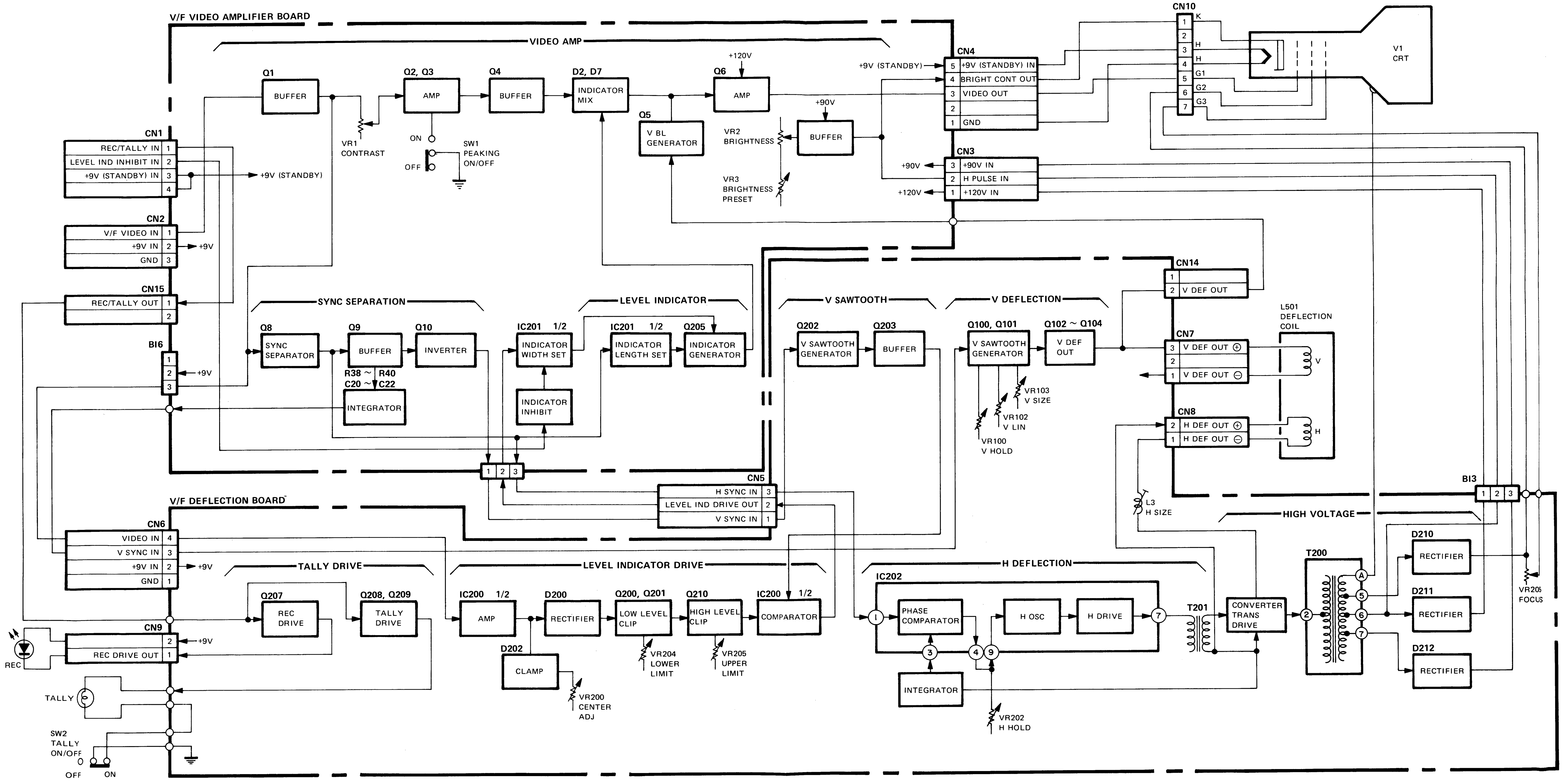
BLOCK DIAGRAM OF HIGH VOLTAGE BOARD


HIGH VOLTAGE
D9, D10
+1KV RECTIFIER
D7, D8
+300V RECTIFIER
D3
+40V RECTIFIER
D4
−12V RECTIFIER
D6
−100V RECTIFIER
D5
+100V RECTIFIER
T1
CONVERTER TRANS
10
1
7
6
5
Q6
INVERTER
IC1
FLIP FLOP
1
2
4
Q2, Q3
DRIVER
Q1
TARGET PROTECTION
VR4 B FOCUS
VR5 G FOCUS
VR6 R FOCUS
VR4
VR5
VR6
TP3
TP1 TP2
VR1
VR2
VR3
VR1 R BEAM
VR2 G BEAM
VR3 B BEAM
VR11 TARGET
B-G3, G6
G-G3, G6
R-G3, G6
B-G5
G-G5
R-G5
R-G4
G-G4
B-G4
B-G2
G-G2
R-G2
B-G1
G-G1
R-G1
CN16
GND 1
B FBC IN 2
R FBC IN 3
G FBC IN 4
TARGET VOLTAGE OUT 5
TARGET PROTECTION IN 6
VS IN 7
HD IN 8
+9.0V IN 9
−9V OUT 10
+9V (STANDBY) IN 11
+40V OUT 12
A
B
C
D
E
F
G
+9V
H
I
J
TP6
FEEDBACK BEAM CONTROL
IC2
R GAMMA CORRECTION
G GAMMA CORRECTION
B GAMMA CORRECTION
8
7
3
4
2
1
VR7 R FBC LEVEL
VR8 G FBC LEVEL
VR9 B FBC LEVEL
IC3
17
AMP
AMP
AMP
12
15
7
10
2
5
−9V DC REGULATOR
Q4
Q5
−9V DC REGULATOR
VR10 −9V ADJ
CATHODE BLANKING
IC4
CATHODE BL MIX
2
7
5
TP5
B-K
G-K
R-K
B-H
G-H
R-H

BLOCK DIAGRAM OF 1.5″ VIEWFINDER WV-VF30


IC1
VR1
V SIZE
SYNC SEPARATOR
V SYNC SEPARATOR
V OSC
V DEF DRIVE
V REF GENERATOR
VIDEO AMP
VIDEO MIX
PHASE COMPARATOR
H OSC
H DEF DRIVE
INDICATOR GENERATOR
R3, R4
C8, C9
INTEGRA-TOR
TP3
VR2
H HOLD
VR4
CONTRAST
VIDEO AMP
OFF
ON
SW1
PEAKING ON/OFF
Q5
VIDEO AMP
VR5
BRIGHTNESS
HIGH VOLTAGE
T1
H DEFLECTION
Q6
H DEF OUT
L4
H SIZE
VR6
FOCUS
5KV
V001
CRT
L001
CRT DEFLECTION COIL
V
H
CN3
4 V DEFLECTION OUT
3 V DEFLECTION OUT
2 H DEFLECTION OUT
1 GND
CN2
1 G3 OUT
2 G2 OUT
3 G1 OUT
4 HEATER (+9V) OUT
5 HEATER (+6V) IN
6 GND
CN001
+1.8V/+4.8V POWER SUPPLY
Q1, Q2
+1.8V POWER SUPPLY
+1.8V
Q3, Q4
+4.8V POWER SUPPLY
+4.8V
VR3
+1.8V ADJ
TP1
LEVEL INDICATOR DRIVE
IC2
AMP
Q7, Q8
LOW LEVEL CLIP
VR7
CENTER ADJ
Q9
INDICATOR INHIBIT
D6
CLAMP
VR8
LOWER LIMIT
Q10
INDICATOR DRIVE
TP2
+6V POWER SUPPLY
Q11
+6V POWER SUPPLY
INDICATOR DRIVE
Q12
CCW DRIVE
Q13
BATTERY WARNING DRIVE
Q14
REC/TALLY DRIVE
+9V
OFF
ON
SW2
TALLY ON/OFF
FCN1
4 REC/TALLY DRIVE OUT
3 BATT DRIVE OUT
2 CCW DRIVE OUT
1 +9V OUT
D101
CCW
D103
BATT/H.G
D102
REC/T
FCN2
2 +9V OUT
1 TALLY DRIVE OUT
D100
CN1
GND 1
LEVEL IND INHIBIT IN 2
BATTERY WARNING IN 3
+9V (STANDBY) IN 4
+9V OUT 5
6
V/F VIDEO IN 7
CCW IN 8
REC/TALLY IN 9
A
B
C
D
E

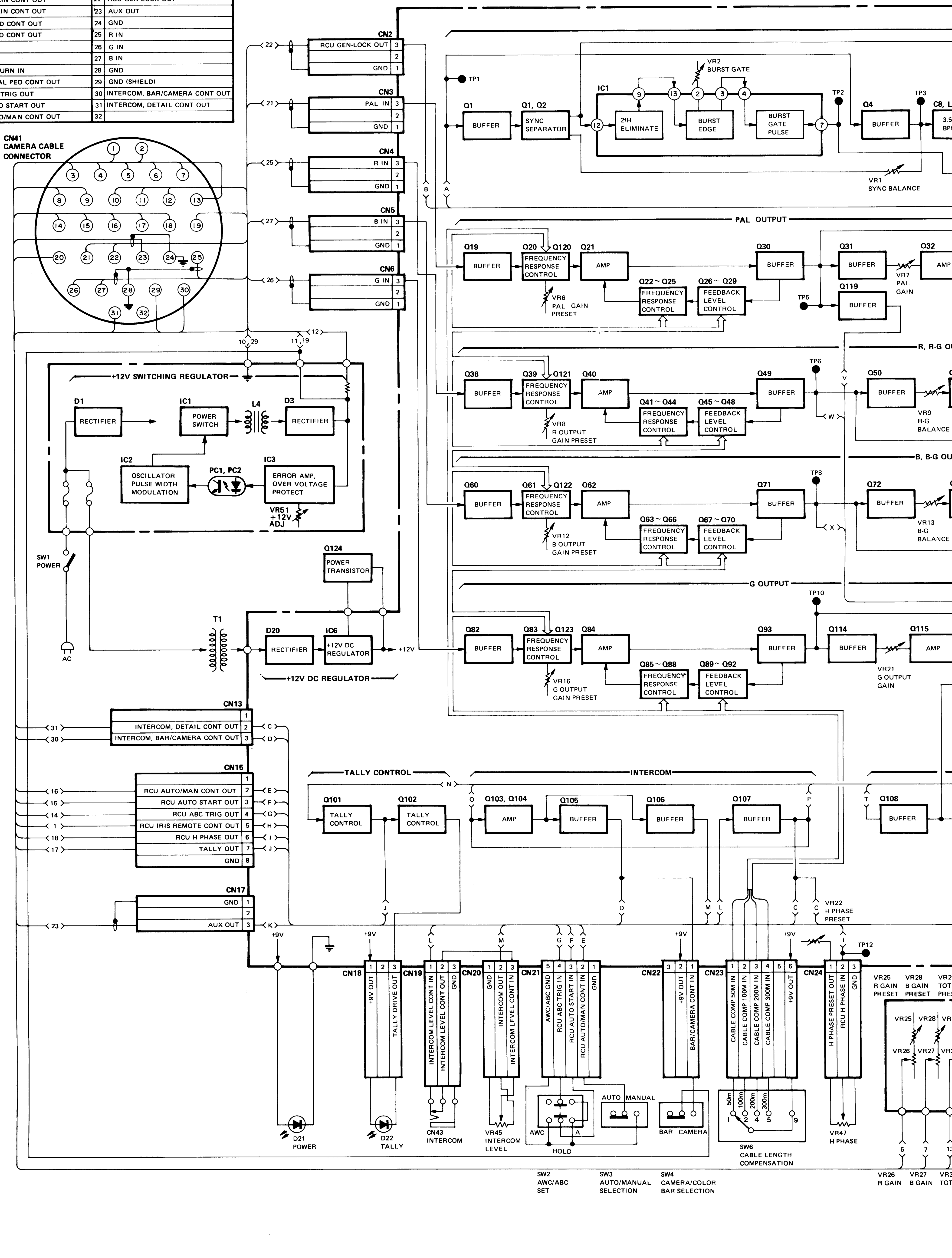
BLOCK DIAGRAM OF 5″ VIEWFINDER WV-VF35


V/F VIDEO AMPLIFIER BOARD
VIDEO AMP
Q1
BUFFER
Q2, Q3
AMP
Q4
BUFFER
D2, D7
INDICATOR MIX
Q6
AMP
+120V
Q5
V BL GENERATOR
VR1 CONTRAST
ON
OFF
SW1 PEAKING ON/OFF
VR2 BRIGHTNESS
+90V
BUFFER
VR3 BRIGHTNESS PRESET
+9V (STANDBY)
CN4
5 +9V (STANDBY) IN
4 BRIGHT CONT OUT
3 VIDEO OUT
2
1 GND
CN3
+90V
3 +90V IN
2 H PULSE IN
+120V
1 +120V IN
CN10
1 K
2
3 H
4 H
5 G1
6 G2
7 G3
V1 CRT
CN1
REC/TALLY IN 1
LEVEL IND INHIBIT IN 2
+9V (STANDBY) IN 3
4
+9V (STANDBY)
CN2
V/F VIDEO IN 1
+9V IN 2
GND 3
+9V
CN15
REC/TALLY OUT 1
2
BI6
1
2
3
+9V
SYNC SEPARATION
Q8
SYNC SEPARATOR
Q9
BUFFER
Q10
INVERTER
R38 ~ R40
C20 ~ C22
INTEGRATOR
LEVEL INDICATOR
IC201 1/2
INDICATOR WIDTH SET
IC201 1/2
INDICATOR LENGTH SET
Q205
INDICATOR GENERATOR
INDICATOR INHIBIT
1 2 3
CN5
H SYNC IN 3
LEVEL IND DRIVE OUT 2
V SYNC IN 1
V SAWTOOTH
Q202
V SAWTOOTH GENERATOR
Q203
BUFFER
V DEFLECTION
Q100, Q101
V SAWTOOTH GENERATOR
Q102 ~ Q104
V DEF OUT
VR103 V SIZE
VR102 V LIN
VR100 V HOLD
CN14
1
2 V DEF OUT
L501 DEFLECTION COIL
CN7
3 V DEF OUT ⊕
2
1 V DEF OUT ⊖
V
CN8
2 H DEF OUT ⊕
1 H DEF OUT ⊖
H
BI3
1 2 3
L3 H SIZE
V/F DEFLECTION BOARD
CN6
VIDEO IN 4
V SYNC IN 3
+9V IN 2
GND 1
+9V
TALLY DRIVE
Q207
REC DRIVE
Q208, Q209
TALLY DRIVE
CN9
2
REC DRIVE OUT 1
+9V
REC
TALLY
SW2 TALLY ON/OFF
OFF
ON
LEVEL INDICATOR DRIVE
IC200 1/2
AMP
D200
RECTIFIER
D202
CLAMP
VR200 CENTER ADJ
Q200, Q201
LOW LEVEL CLIP
VR204 LOWER LIMIT
Q210
HIGH LEVEL CLIP
VR205 UPPER LIMIT
IC200 1/2
COMPARATOR
H DEFLECTION
IC202
1
PHASE COMPARATOR
H OSC
H DRIVE
7
3
4
9
INTEGRATOR
VR202 H HOLD
T201
CONVERTER TRANS DRIVE
HIGH VOLTAGE
T200
2
A
5
6
7
D210
RECTIFIER
D211
RECTIFIER
D212
RECTIFIER
VR201 FOCUS

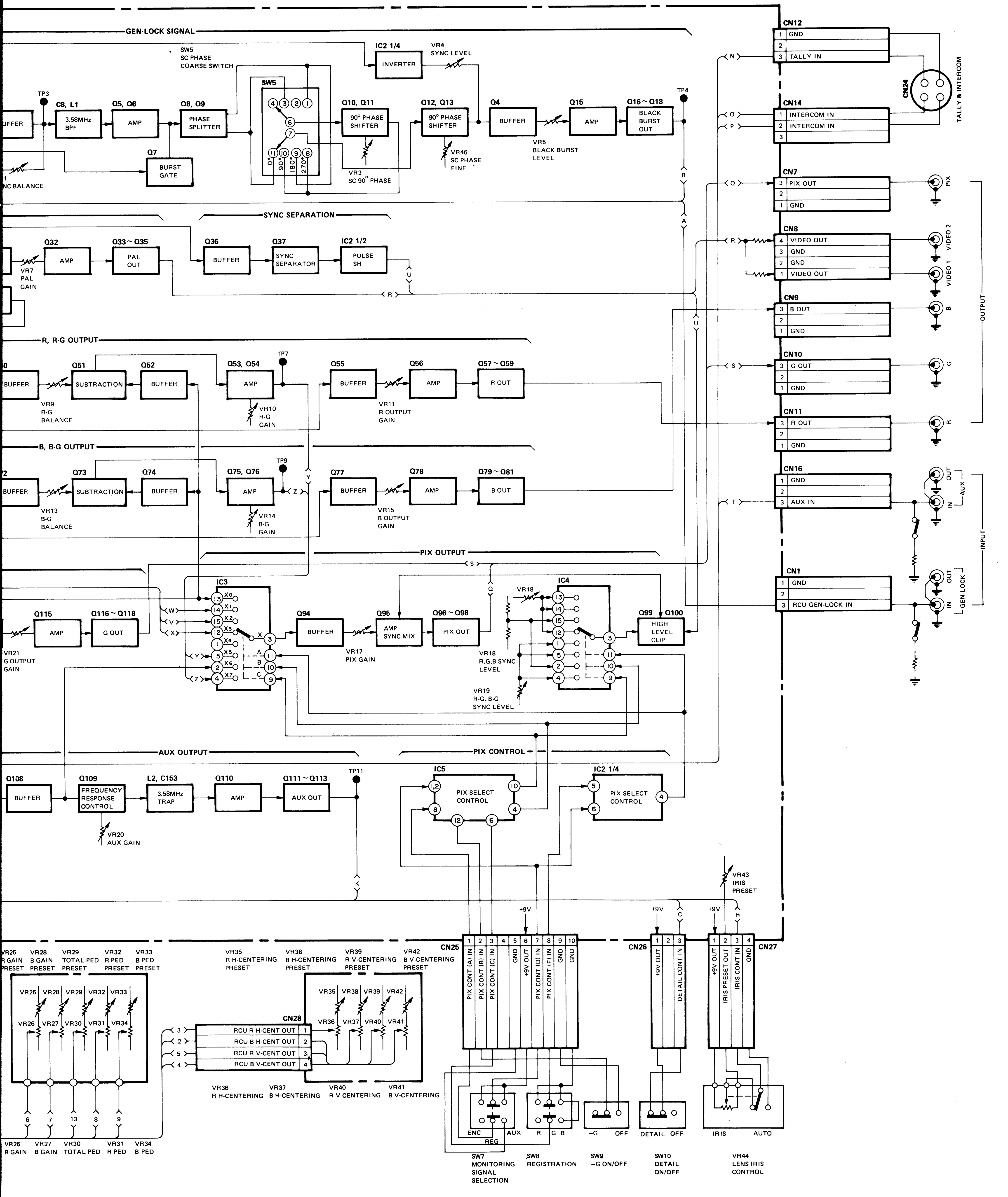
BLOCK DIAGRAM OF REMOTE CONT

CN41

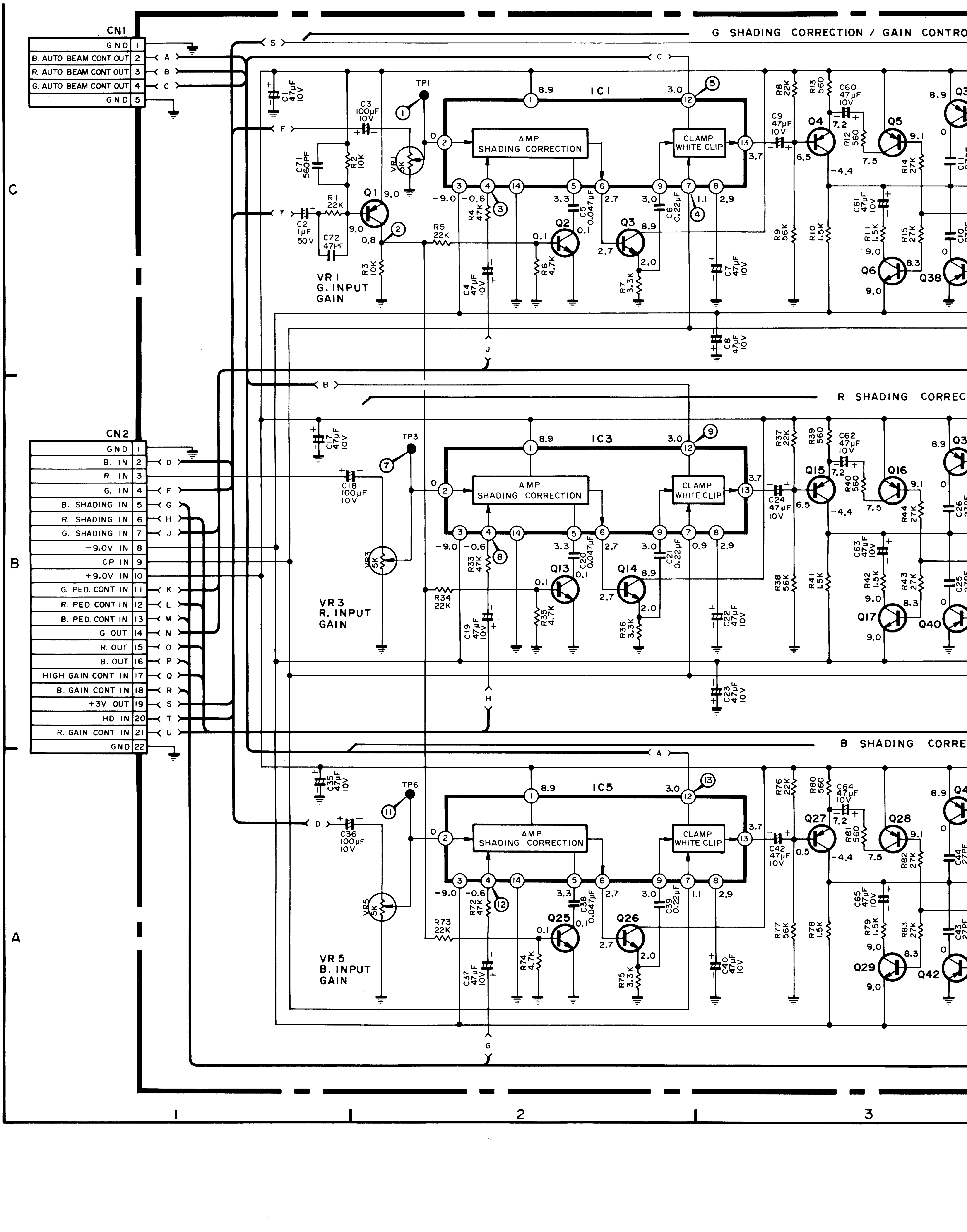
1	RCU IRIS REMOTE CONT OUT	17	TALLY OUT
2	RCU B H-CENT OUT	18	RCU H PHASE OUT
3	RCU R H-CENT OUT	19	+12V OUT
4	RCU B V-CENT OUT	20	GND
5	RCU R V-CENT OUT	21	PAL IN
	RCU R GAIN CONT OUT	22	RCU GEN-LOCK OUT
7	RCU B GAIN CONT OUT	23	AUX OUT
8	RCU R PED CONT OUT	24	GND
9	RCU B PED CONT OUT	25	R IN
10	GND	26	G IN
11	+12V OUT	27	B IN
12	+12V RETURN IN	28	GND
13	RCU TOTAL PED CONT OUT	29	GND (SHIELD)
14	RCU ABC TRIG OUT	30	INTERCOM, BAR/CAMERA CONT OUT
15	RCU AUTO START OUT	31	INTERCOM, DETAIL CONT OUT
16	RCU AUTO/MAN CONT OUT	32	


CN41
CAMERA CABLE
CONNECTOR
CN2
RCU GEN-LOCK OUT
GND
CN3
PAL IN
CN4
R IN
CN5
B IN
CN6
G IN
+12V SWITCHING REGULATOR
D1
RECTIFIER
IC1
POWER SWITCH
L4
D3
IC2
OSCILLATOR PULSE WIDTH MODULATION
PC1, PC2
IC3
ERROR AMP, OVER VOLTAGE PROTECT
VR51 +12V ADJ
SW1 POWER
AC
T1
Q124
POWER TRANSISTOR
D20
IC6
+12V DC REGULATOR
+12V DC REGULATOR
+12V
CN13
INTERCOM, DETAIL CONT OUT
INTERCOM, BAR/CAMERA CONT OUT
CN15
RCU AUTO/MAN CONT OUT
RCU AUTO START OUT
RCU ABC TRIG OUT
RCU IRIS REMOTE CONT OUT
RCU H PHASE OUT
TALLY OUT
CN17
AUX OUT
TP1
Q1
BUFFER
Q1, Q2
SYNC SEPARATOR
IC1
2fH ELIMINATE
VR2
BURST GATE
BURST EDGE
BURST GATE PULSE
TP2
TP3
Q4
C8, L
3.5
BP
VR1
SYNC BALANCE
PAL OUTPUT
Q19
Q20
Q120
Q21
FREQUENCY RESPONSE CONTROL
AMP
Q22 ~ Q25
Q26 ~ Q29
FEEDBACK LEVEL CONTROL
VR6
PAL GAIN PRESET
Q30
Q31
Q32
Q119
TP5
VR7
PAL GAIN
R, R-G OU
Q38
Q39
Q121
Q40
Q41 ~ Q44
Q45 ~ Q48
VR8
R OUTPUT GAIN PRESET
Q49
TP6
Q50
VR9
R-G BALANCE
B, B-G OU
Q60
Q61
Q122
Q62
Q63 ~ Q66
Q67 ~ Q70
VR12
B OUTPUT GAIN PRESET
Q71
TP8
Q72
VR13
B-G BALANCE
G OUTPUT
Q82
Q83
Q123
Q84
Q85 ~ Q88
Q89 ~ Q92
VR16
G OUTPUT GAIN PRESET
Q93
TP10
Q114
Q115
VR21
G OUTPUT GAIN
TALLY CONTROL
Q101
Q102
INTERCOM
Q103, Q104
Q105
Q106
Q107
Q108
VR22
H PHASE PRESET
TP12
+9V
CN18
+9V OUT
TALLY DRIVE OUT
CN19
INTERCOM LEVEL CONT IN
INTERCOM LEVEL CONT OUT
GND
CN20
INTERCOM OUT
INTERCOM LEVEL CONT IN
CN21
AWC/ABC GND
RCU ABC TRIG IN
RCU AUTO START IN
RCU AUTO/MAN CONT IN
CN22
BAR/CAMERA CONT IN
CN23
CABLE COMP 50M IN
CABLE COMP 100M IN
CABLE COMP 200M IN
CABLE COMP 300M IN
CN24
H PHASE PRESET OUT
RCU H PHASE IN
VR25 R GAIN PRESET
VR28 B GAIN PRESET
VR2 TOT PRE
D21 POWER
D22 TALLY
CN43 INTERCOM
VR45 INTERCOM LEVEL
AWC
HOLD
AUTO
MANUAL
BAR
CAMERA
50m
100m
200m
300m
SW6 CABLE LENGTH COMPENSATION
VR47 H PHASE
SW2 AWC/ABC SET
SW3 AUTO/MANUAL SELECTION
SW4 CAMERA/COLOR BAR SELECTION
VR26 R GAIN
VR27 B GAIN
VR3 TOT

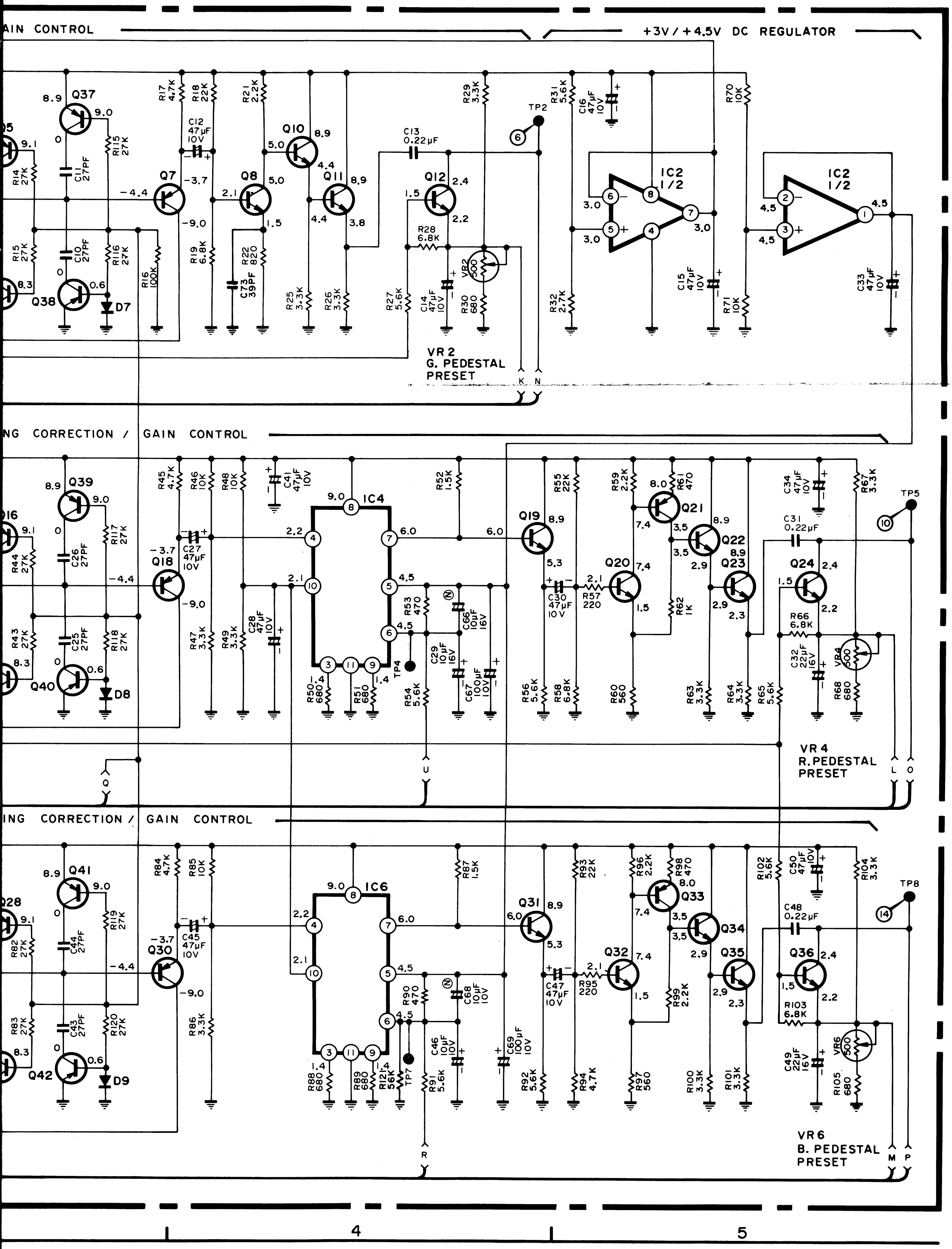
CONTROL UNIT (RCU) WV-RC30


GEN-LOCK SIGNAL
SW5 SC PHASE COARSE SWITCH
IC2 1/4
INVERTER
VR4 SYNC LEVEL
TP3
C8, L1
3.58MHz BPF
Q5, Q6
AMP
Q8, Q9
PHASE SPLITTER
SW5
0°
90°
180°
270°
Q10, Q11
90° PHASE SHIFTER
Q12, Q13
90° PHASE SHIFTER
VR3 SC 90° PHASE
VR46 SC PHASE FINE
Q4
BUFFER
Q15
AMP
Q16~Q18
BLACK BURST OUT
VR5 BLACK BURST LEVEL
TP4
Q7
BURST GATE
UFFER
NC BALANCE
SYNC SEPARATION
Q32
AMP
Q33~Q35
PAL OUT
VR7 PAL GAIN
Q36
BUFFER
Q37
SYNC SEPARATOR
IC2 1/2
PULSE SH
R, R-G OUTPUT
Q51
BUFFER
SUBTRACTION
Q52
BUFFER
Q53, Q54
AMP
TP7
VR9 R-G BALANCE
VR10 R-G GAIN
Q55
BUFFER
Q56
AMP
Q57~Q59
R OUT
VR11 R OUTPUT GAIN
B, B-G OUTPUT
Q73
SUBTRACTION
Q74
BUFFER
Q75, Q76
AMP
TP9
VR13 B-G BALANCE
VR14 B-G GAIN
Q77
BUFFER
Q78
AMP
Q79~Q81
B OUT
VR15 B OUTPUT GAIN
PIX OUTPUT
Q115
AMP
Q116~Q118
G OUT
VR21 G OUTPUT GAIN
IC3
Q94
BUFFER
Q95
AMP SYNC MIX
Q96~Q98
PIX OUT
VR17 PIX GAIN
IC4
VR18
VR18 R,G,B SYNC LEVEL
VR19 R-G, B-G SYNC LEVEL
Q99, Q100
HIGH LEVEL CLIP
AUX OUTPUT
Q108
BUFFER
Q109
FREQUENCY RESPONSE CONTROL
VR20 AUX GAIN
L2, C153
3.58MHz TRAP
Q110
AMP
Q111~Q113
AUX OUT
TP11
PIX CONTROL
IC5
PIX SELECT CONTROL
IC2 1/4
PIX SELECT CONTROL
CN12
GND
TALLY IN
CN24
TALLY & INTERCOM
CN14
INTERCOM IN
INTERCOM IN
CN7
PIX OUT
GND
PIX
CN8
VIDEO OUT
GND
GND
VIDEO OUT
VIDEO 2
VIDEO 1
CN9
B OUT
GND
B
CN10
G OUT
GND
G
CN11
R OUT
GND
R
OUTPUT
CN16
GND
AUX IN
OUT
IN
AUX
INPUT
CN1
GND
RCU GEN-LOCK IN
OUT
IN
GEN-LOCK
VR43 IRIS PRESET
+9V
CN25
PIX CONT (A) IN
PIX CONT (B) IN
PIX CONT (C) IN
GND
+9V OUT
PIX CONT (D) IN
PIX CONT (E) IN
GND
GND
CN26
+9V OUT
DETAIL CONT IN
CN27
+9V OUT
IRIS PRESET OUT
IRIS CONT IN
GND
VR25 R GAIN PRESET
VR28 B GAIN PRESET
VR29 TOTAL PED PRESET
VR32 R PED PRESET
VR33 B PED PRESET
VR35 R H-CENTERING PRESET
VR38 B H-CENTERING PRESET
VR39 R V-CENTERING PRESET
VR42 B V-CENTERING PRESET
CN28
RCU R H-CENT OUT
RCU B H-CENT OUT
RCU R V-CENT OUT
RCU B V-CENT OUT
VR36 R H-CENTERING
VR37 B H-CENTERING
VR40 R V-CENTERING
VR41 B V-CENTERING
VR26 R GAIN
VR27 B GAIN
VR30 TOTAL PED
VR31 R PED
VR34 B PED
ENC
AUX
REG
R
G
B
-G
OFF
DETAIL
OFF
IRIS
AUTO
SW7 MONITORING SIGNAL SELECTION
SW8 REGISTRATION
SW9 -G ON/OFF
SW10 DETAIL ON/OFF
VR44 LENS IRIS CONTROL

SCHEMATIC DIAGRAM


CN1
GND 1
B. AUTO BEAM CONT OUT 2
R. AUTO BEAM CONT OUT 3
G. AUTO BEAM CONT OUT 4
GND 5
CN2
GND 1
B. IN 2
R. IN 3
G. IN 4
B. SHADING IN 5
R. SHADING IN 6
G. SHADING IN 7
-9.0V IN 8
CP IN 9
+9.0V IN 10
G. PED. CONT IN 11
R. PED. CONT IN 12
B. PED. CONT IN 13
G. OUT 14
R. OUT 15
B. OUT 16
HIGH GAIN CONT IN 17
B. GAIN CONT IN 18
+3V OUT 19
HD IN 20
R. GAIN CONT IN 21
GND 22
G SHADING CORRECTION / GAIN CONTRO
R SHADING CORREC
B SHADING CORRE
IC1
IC3
IC5
AMP SHADING CORRECTION
CLAMP WHITE CLIP
TP1
TP3
TP6
VR1 G. INPUT GAIN
VR3 R. INPUT GAIN
VR5 B. INPUT GAIN
Q1
Q2
Q3
Q4
Q5
Q6
Q13
Q14
Q15
Q16
Q17
Q25
Q26
Q27
Q28
Q29
Q38
Q40
Q42
C
B
A
1
2
3

GRAM OF PROCESS-1 BOARD

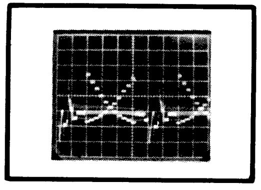


IN CONTROL
+3V / +4.5V DC REGULATOR
NG CORRECTION / GAIN CONTROL
ING CORRECTION / GAIN CONTROL
Q37
Q38
Q7
Q8
Q10
Q11
Q12
TP2
IC2 1/2
IC2 1/2
VR 2 G. PEDESTAL PRESET
K
N
Q39
Q40
Q18
IC4
Q19
Q20
Q21
Q22
Q23
Q24
TP4
TP5
VR 4 R. PEDESTAL PRESET
L
O
U
Q41
Q42
Q30
IC6
Q31
Q32
Q33
Q34
Q35
Q36
TP7
TP8
VR 6 B. PEDESTAL PRESET
M
P
R
D7
D8
D9
C12 47μF 10V
C13 0.22μF
C16 47μF 10V
C15 47μF 10V
C33 47μF 10V
C14 47μF 10V
C27 47μF 10V
C41 47μF 10V
C28 47μF 10V
C31 0.22μF
C34 47μF 10V
C30 47μF 10V
C32 22μF 16V
C45 47μF 10V
C48 0.22μF
C50 47μF 10V
C47 47μF 10V
C49 22μF 16V
C69 100μF 10V
4
5

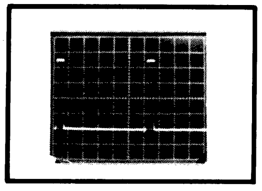
IC 1	EHMS725W69S	C2,
IC 2	NJM4556D	C5
IC 3	EHMS725W69S	B2,
IC 4	An610P	B4
IC 5	EHMS725W69S	A2,
IC 6	AN610P	A4
Q 1	2SB641-RS	C2
Q 2	2SC641K-C	C2
Q 3	2SD661-TU	C2
Q 4	2SB641-RS	C3
Q 5	2SB641-RS	C3
Q 6	2SD636-RS	C3
Q 7	2SB641-RS	C3
Q 8	2SD636-RS	C4
Q10	2SD636-RS	C4
Q11	2SD661-TU	C4
Q12	2SC641K-C	C4
Q13	2SC641K-C	B2
Q14	2SD661-TU	B2
Q15	2SB641-RS	B3
Q16	2SB641-RS	B3
Q17	2SD636-RS	B3
Q18	2SB641-RS	B3,
Q19	2SD636-RS	B4
Q20	2SD636-RS	B5
Q21	2SB641-RS	B5
Q22	2SD636-RS	B5
Q23	2SD636-RS	B5
Q24	2SC641K-C	B5
Q25	2SC641K-C	A2
Q26	2SD661-TU	A2
Q27	2SB641-RS	A3
Q28	2SB641-RS	A3
Q29	2SD636-RS	A3
Q30	2SB641-RS	A3
Q31	2SD636-RS	A4,
Q32	2SD636-RS	A5
Q33	2SB641-RS	A5
Q34	2SD636-RS	A5
Q35	2SD661-TU	A5
Q36	2SC641K-C	A5
Q37	2SB641-RS	C3
Q38	2SB641-RS	C3
Q39	2SB641-RS	B3
Q40	2SB641-RS	B3
Q41	2SB641-RS	A3
Q42	2SB641-RS	A3
D7	MA165	C3
D8	MA165	B3
D9	MA165	A3

SIGNAL WAVEFORMS OF PROCESS-1 BOARD

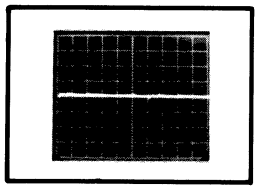
1 0.02V/DIV, 10μs/DIV



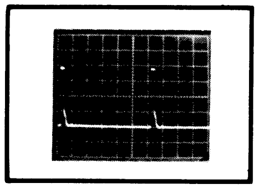
2 2V/DIV, 10μs/DIV



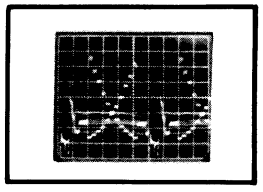
3 0.02V/DIV, 10μs/DIV



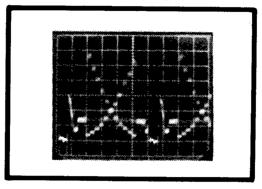
4 2V/DIV, 10μs/DIV



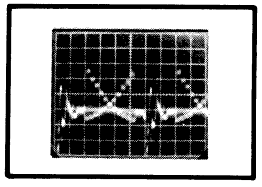
5 0.05V/DIV, 10μs/DIV



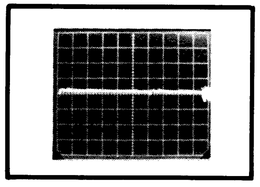
6 0.2V/DIV, 10μs/DIV



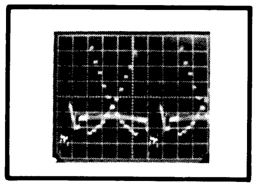
7 0.02V/DIV, 10μs/DIV



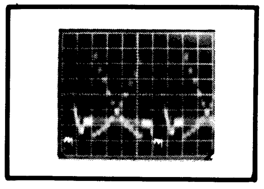
8 0.02V/DIV, 10μs/DIV



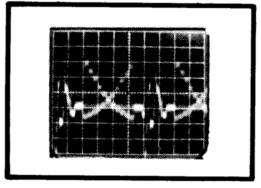
9 0.05V/DIV, 10μs/DIV



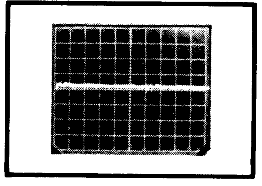
10 0.02V/DIV, 10μs/DIV



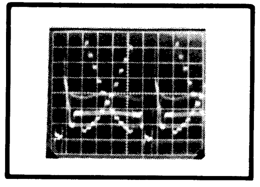
11 0.02V/DIV, 10μs/DIV



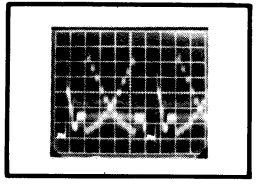
12 0.02V/DIV, 10μs/DIV



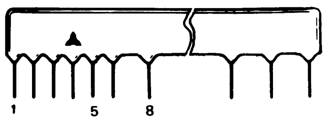
13 0.05V/DIV, 10μs/DIV



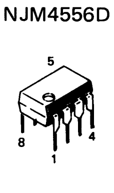
14 0.2V/DIV, 10μs/DIV



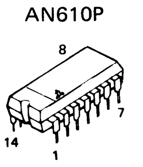
EHMS725W69S



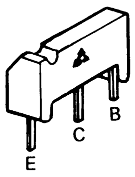
NJM4556D



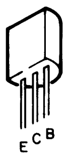
AN610P



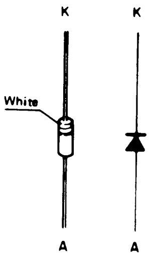
2SB641-RS
2SD636-RS
2SD661-TU



2SC641K-C



MA165



CONDUCTO

D

CN1

GND	1
B. AUTO BEAM CONT OUT	2
R. AUTO BEAM CONT OUT	3
G. AUTO BEAM CONT OUT	4
GND	5

C

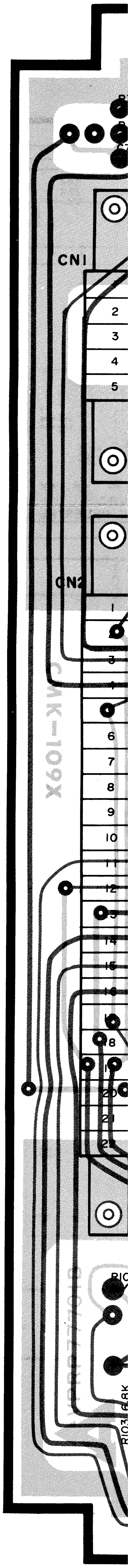
CN2

GND	1
B. IN	2
R. IN	3
G. IN	4
B. SHADING IN	5
R. SHADING IN	6
G. SHADING IN	7
−9.0V IN	8
CP IN	9
+9.0V IN	10
G. PED. CONT IN	11
R. PED. CONT IN	12
B. PED. CONT IN	13
G. OUT	14
R. OUT	15
B. OUT	16
HIGH GAIN CONT IN	17
B. GAIN CONT IN	18
+3V OUT	19
HD IN	20
R. GAIN CONT IN	21
GND	22

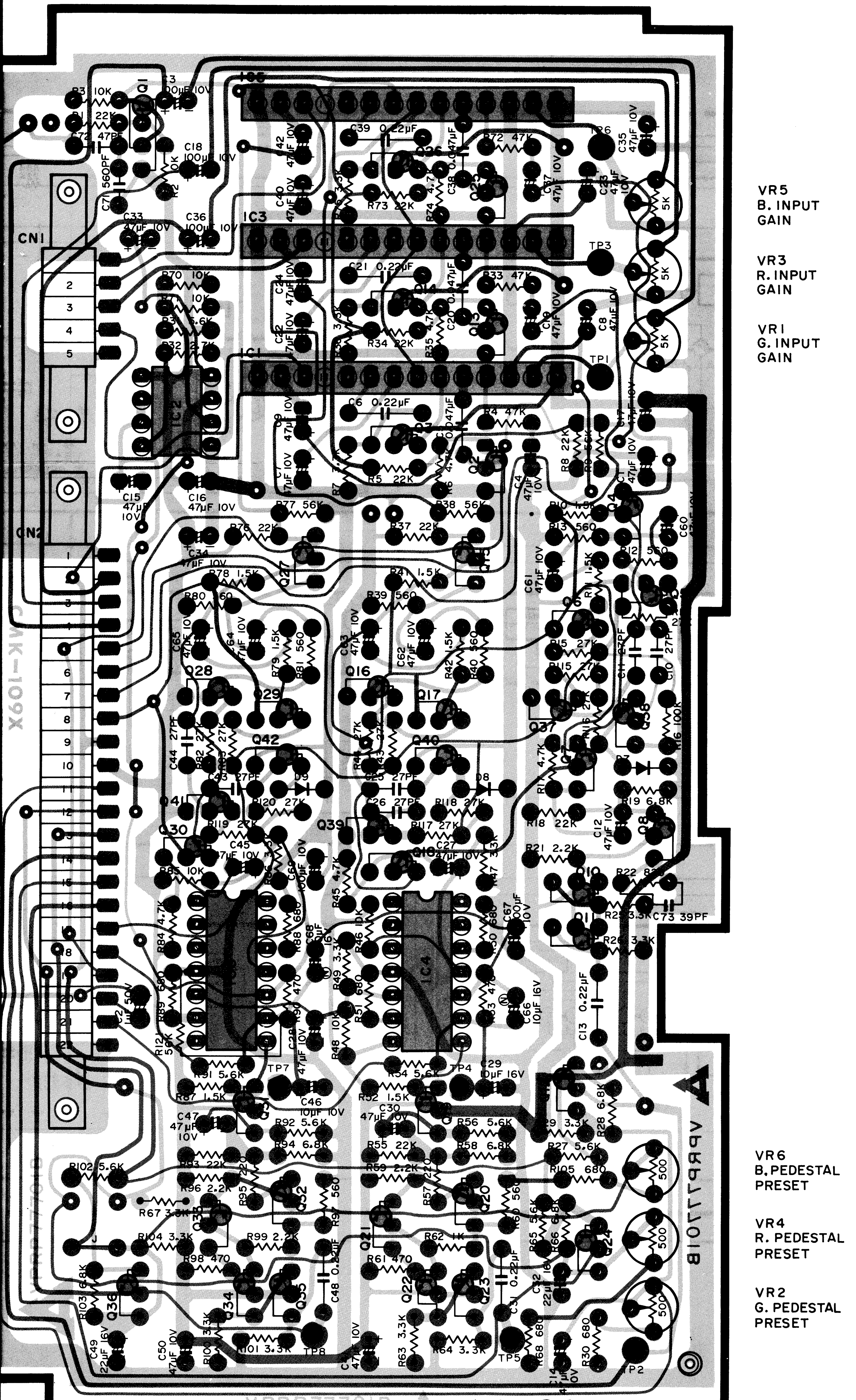
B

A

1

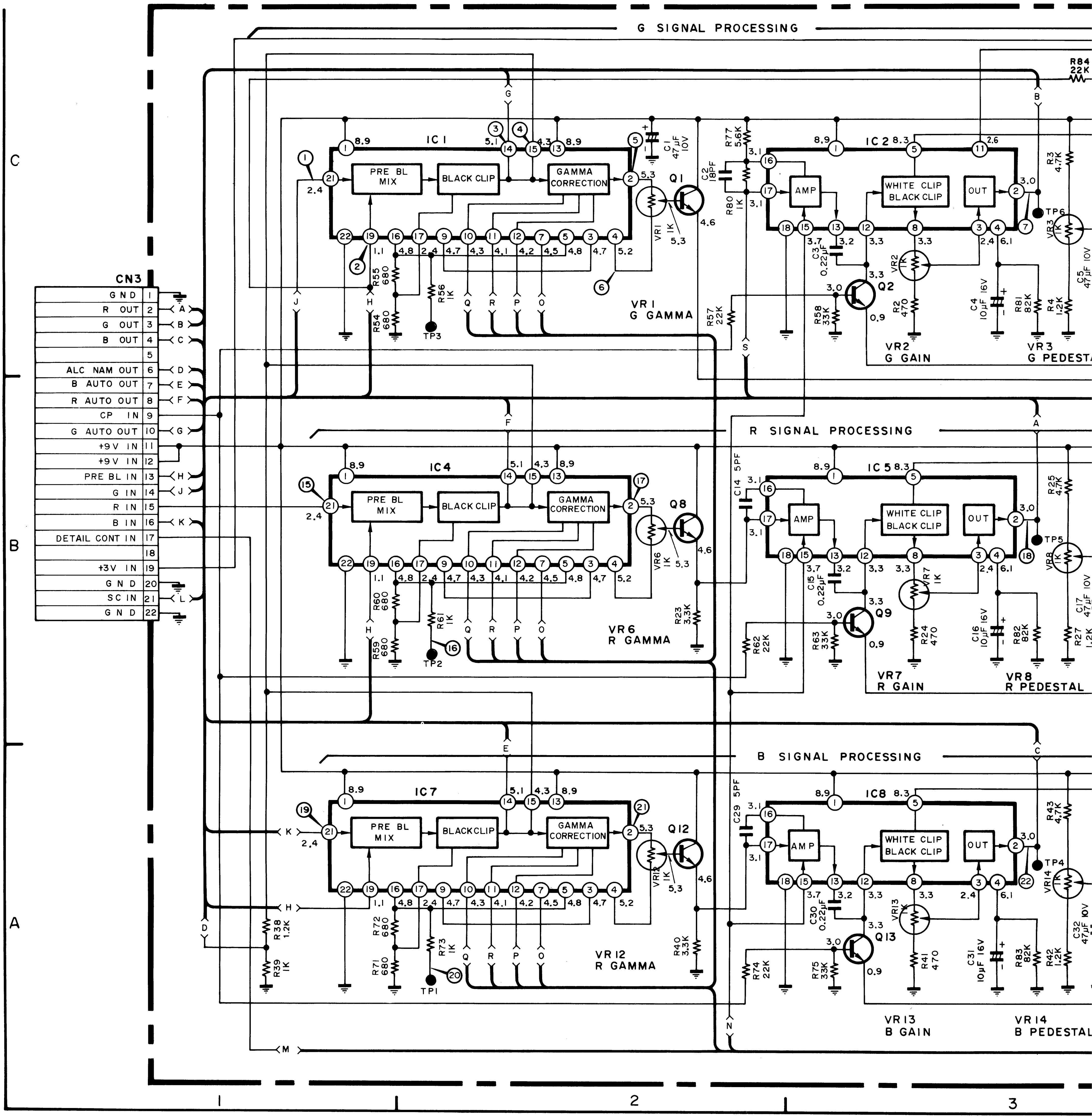


UCTOR VIEW OF PROCESS-1 BOARD

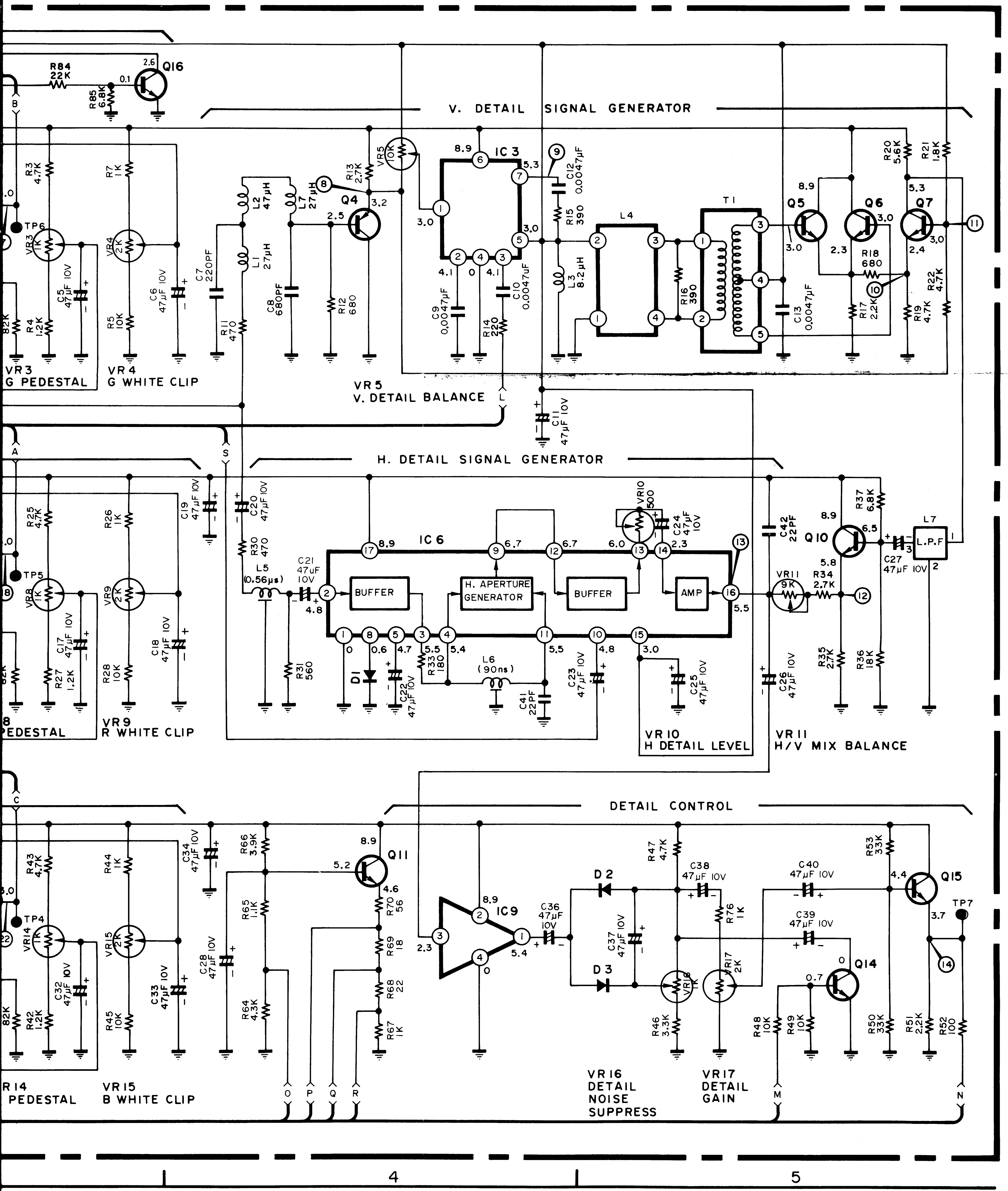

VR5
B. INPUT
GAIN
VR3
R. INPUT
GAIN
VR1
G. INPUT
GAIN
VR6
B. PEDESTAL
PRESET
VR4
R. PEDESTAL
PRESET
VR2
G. PEDESTAL
PRESET
IC1
IC2
IC3
IC4
IC5
IC6
CN1
CN2
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
GWK-109X
VPRP7701B
PROCESS-1
1
2
3

IC 1	EHMS725W69S	D2, D3
IC 2	NJM4556D	C2, D2
IC 3	EHMS725W69S	D2, D3
IC 4	AN610P	B2
IC 5	EHMS725W69S	D2, D3
IC 6	AN610P	B2
Q 1	2SB641-RS	D1, D2
Q 2	2SC641K-C	C2
Q 3	2SD661-TU	C2
Q 4	2SB641-RS	C3
Q 5	2SB641-RS	C3
Q 6	2SD636-RS	C3
Q 7	2SB641-RS	C3, B3
Q 8	2SD636-RS	B3
Q10	2SD636-RS	B3
Q11	2SD661-TU	B3
Q12	2SC641K-C	B3
Q13	2SC641K-C	D2, D3
Q14	2SD661-TU	D2
Q15	2SB641-RS	C2
Q16	2SB641-RS	C2
Q17	2SD636-RS	C2
Q18	2SB641-RS	B2
Q19	2SD636-RS	B2
Q20	2SD636-RS	A2
Q21	2SB641-RS	A2
Q22	2SD636-RS	A2
Q23	2SD636-RS	A2
Q24	2SC641K-C	A3
Q25	2SC641K-C	D2, D3
Q26	2SD661-TU	D2
Q27	2SB641-RS	C2
Q28	2SB641-RS	C2
Q29	2SD636-RS	C2
Q30	2SB641-RS	B2
Q31	2SD636-RS	B2
Q32	2SD636-RS	A2
Q33	2SB641-RS	A2
Q34	2SD636-RS	A2
Q35	2SD661-TU	A2
Q36	2SC641K-C	A1
Q37	2SB641-RS	C3
Q38	2SB641-RS	C3
Q39	2SB641-RS	B2
Q40	2SB641-RS	B2, C2
Q41	2SB641-RS	B2
Q42	2SB641-RS	B2, C2
D7	MA165	B3, C3
D8	MA165	B2
D9	MA165	B2

SCHEMATIC DIAGRAM


G SIGNAL PROCESSING
R SIGNAL PROCESSING
B SIGNAL PROCESSING
CN3
GND 1
R OUT 2
G OUT 3
B OUT 4
5
ALC NAM OUT 6
B AUTO OUT 7
R AUTO OUT 8
CP IN 9
G AUTO OUT 10
+9V IN 11
+9V IN 12
PRE BL IN 13
G IN 14
R IN 15
B IN 16
DETAIL CONT IN 17
18
+3V IN 19
GND 20
SC IN 21
GND 22
IC1
IC4
IC7
PRE BL MIX
BLACK CLIP
GAMMA CORRECTION
IC2
IC5
IC8
AMP
WHITE CLIP BLACK CLIP
OUT
Q1
Q2
Q8
Q9
Q12
Q13
VR1 G GAMMA
VR6 R GAMMA
VR12 R GAMMA
VR2 G GAIN
VR3 G PEDEST
VR7 R GAIN
VR8 R PEDESTAL
VR13 B GAIN
VR14 B PEDESTAL
C1 47μF 10V
C2 18PF
C3 0.22μF
C4 10μF 16V
C5 47μF 10V
C14 5PF
C15 0.22μF
C16 10μF 16V
C17 47μF 10V
C29 5PF
C30 0.22μF
C31 10μF 16V
C32 47μF 10V
R2 470
R3 4.7K
R4 1.2K
R23 3.3K
R24 470
R25 4.7K
R27 1.2K
R38 1.2K
R39 1K
R40 3.3K
R41 470
R42 1.2K
R43 4.7K
R54 680
R55 680
R56 1K
R57 22K
R58 33K
R59 680
R60 680
R61 1K
R62 22K
R63 33K
R71 680
R72 680
R73 1K
R74 22K
R75 33K
R77 5.6K
R80 1K
R81 82K
R82 82K
R83 82K
R84 22K
TP1
TP2
TP3
TP4
TP5
TP6
A B C D E F G H J K L M N O P Q R S
1
2
3
A
B
C

GRAM OF PROCESS-2 BOARD

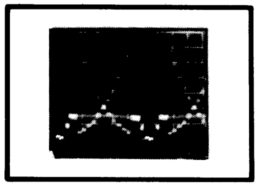

V. DETAIL SIGNAL GENERATOR
H. DETAIL SIGNAL GENERATOR
DETAIL CONTROL
R84 22K
R85 6.8K
Q16
Q4
Q5
Q6
Q7
Q10
Q11
Q14
Q15
IC 3
IC 6
IC 9
L4
T1
L7 L.P.F
BUFFER
H. APERTURE GENERATOR
AMP
D1
D2
D3
TP4
TP5
TP6
TP7
VR3 G PEDESTAL
VR4 G WHITE CLIP
VR5 V. DETAIL BALANCE
VR9 R WHITE CLIP
VR10 H DETAIL LEVEL
VR11 H/V MIX BALANCE
R14 PEDESTAL
VR15 B WHITE CLIP
VR16 DETAIL NOISE SUPPRESS
VR17 DETAIL GAIN
L5 (0.56µs)
L6 (90ns)
A
B
C
S
L
M
N
O
P
Q
R
4
5

IC 1	EHMS935W73S	C1, C2
IC 2	EHMS831W74S	C3
IC 3	AN614	C4
IC 4	EHMS935W73S	B1, B2
IC 5	EHMS831W74SA	B3
IC 6	EHMSU31W70S	B4, B5
IC 7	EHMS935W73S	A1, A2
IC 8	EHMS831W74SA	A3
IC 9	AN608P	A4
Q 1	2SD636-RS	C2
Q 2	2SC641K-C	C3
Q 4	2SB641-QR	C4
Q 5	2SC2377-CD	C5
Q 6	2SC2377-CD	C5
Q 7	2SD636-RS	C5
Q 8	2SD636-RS	B2
Q 9	2SC641K-C	B3
Q10	2SD636-RS	B5
Q11	2SD636-RS	A4
Q12	2SD636-RS	A2
Q13	2SC641K-C	A3
Q14	2SD636-RS	A5
Q15	2SD636-RS	A5
Q16	2SC641K-C	C3
D 1	MA26	B4
D 2	IS192E	A5
D 3	IS192E	A5

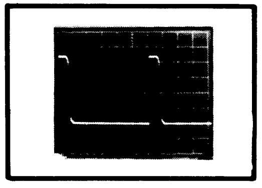
SIGNAL WAVEFORMS OF PROCESS-2 BOARD

CONDU

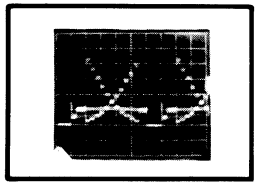
1 0.2V/DIV, 10μs/DIV



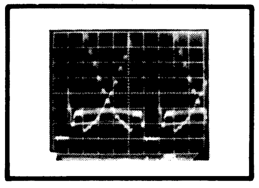
2 2V/DIV, 10μs/DIV



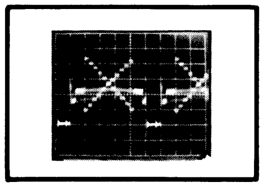
3 0.5V/DIV, 10μs/DIV



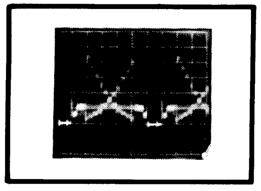
4 0.2V/DIV, 10μs/DIV



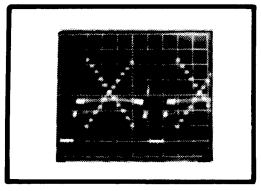
5 0.1V/DIV, 10μs/DIV



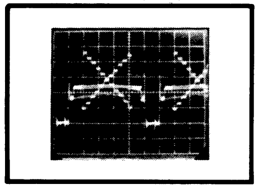
6 0.1V/DIV, 10μs/DIV



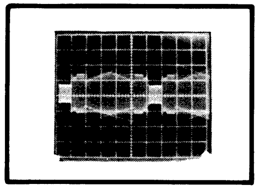
7 0.1V/DIV, 10μs/DIV



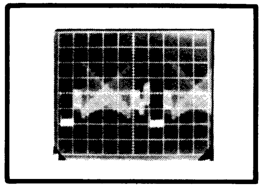
8 0.05V/DIV, 10μs/DIV



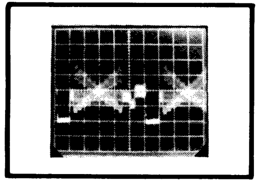
9 0.2V/DIV, 10μs/DIV



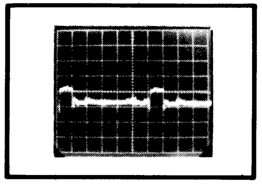
10 0.02V/DIV, 10μs/DIV



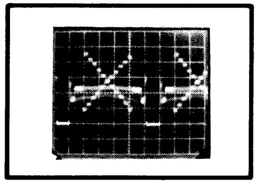
11 0.02V/DIV, 10μs/DIV



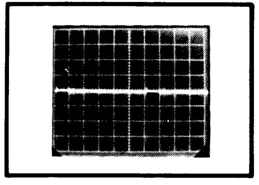
12 0.02V/DIV, 10μs/DIV



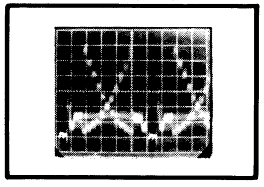
13 0.05V/DIV, 10μs/DIV



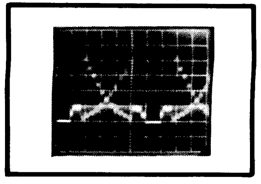
14 0.05V/DIV, 10μs/DIV



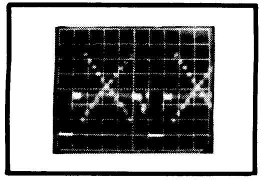
15 0.2V/DIV, 10μs/DIV



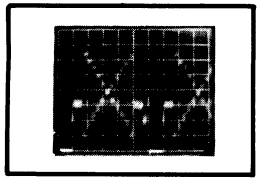
16 0.5V/DIV, 10μs/DIV



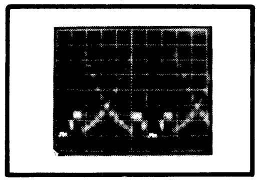
17 0.1V/DIV, 10μs/DIV



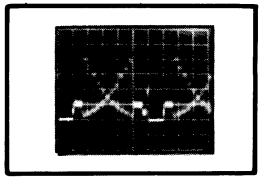
18 0.1V/DIV, 10μs/DIV



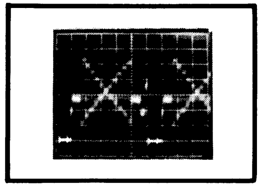
19 0.2V/DIV, 10μs/DIV



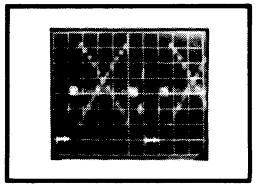
20 0.5V/DIV, 10μs/DIV



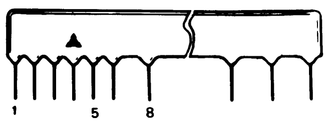
21 0.1V/DIV, 10μs/DIV



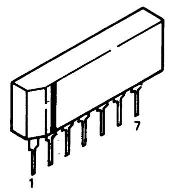
22 0.1V/DIV, 10μs/DIV



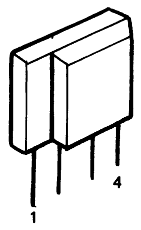
EHMSU31W70S
EHMS831W74SA
EHMS935W73S



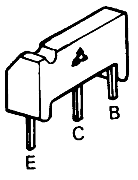
AN614



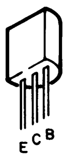
AN608P



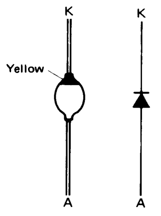
2SB641-QR
2SD636-RS



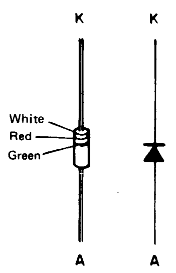
2SC641K-C



MA26

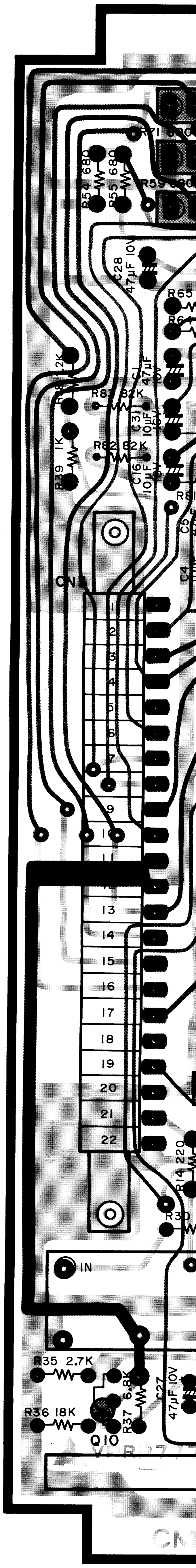

K
K
Yellow
A
A

IS192E

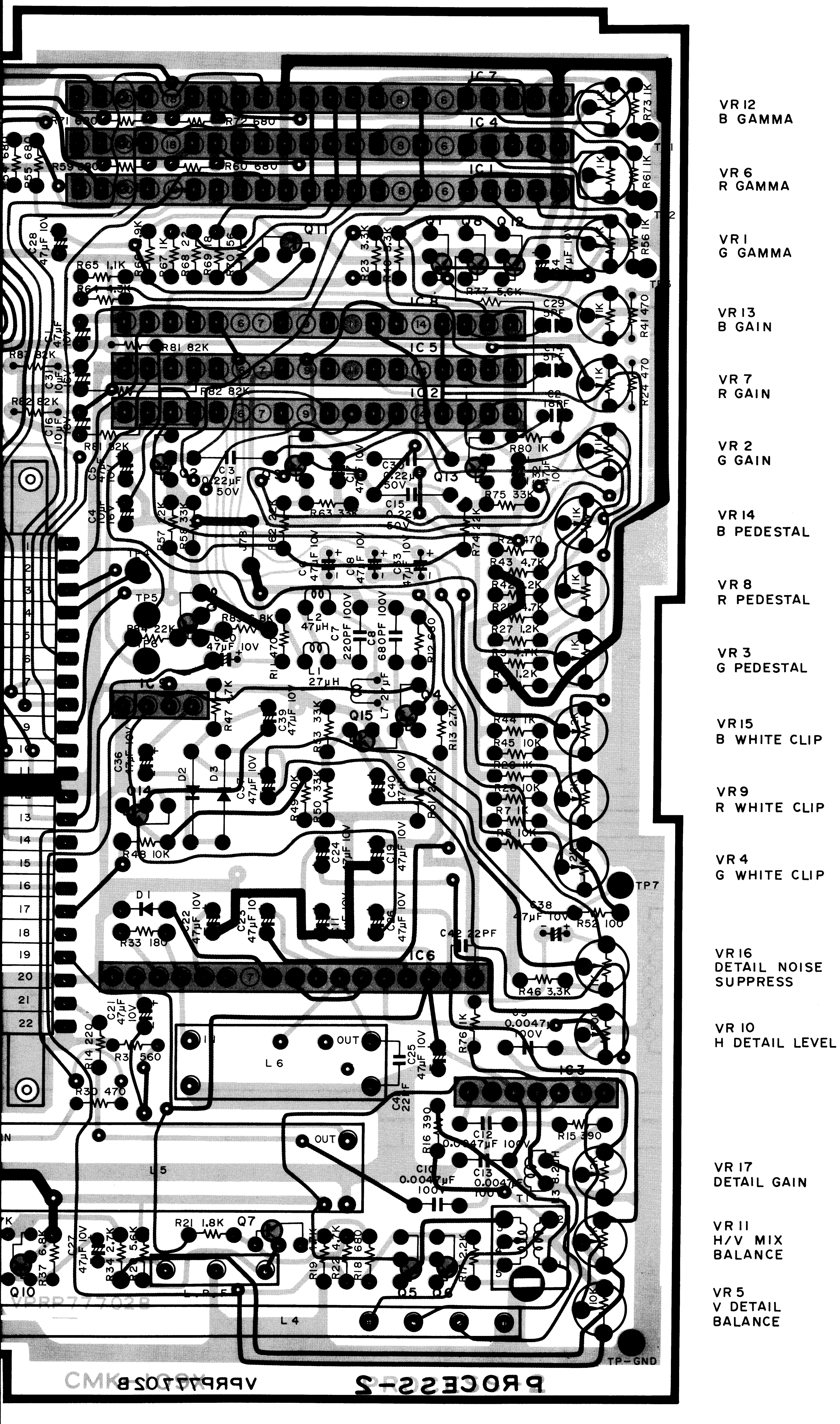

K
K
White
Red
Green
A
A

CN3

GND	1
R OUT	2
G OUT	3
B OUT	4
	5
ALC NAM OUT	6
B AUTO OUT	7
R AUTO OUT	8
CP IN	9
G AUTO OUT	10
+9V IN	11
+9V IN	12
PRE BL IN	13
G IN	14
R IN	15
B IN	16
DETAIL CONT IN	17
	18
+3V IN	19
GND	20
SC IN	21
GND	22

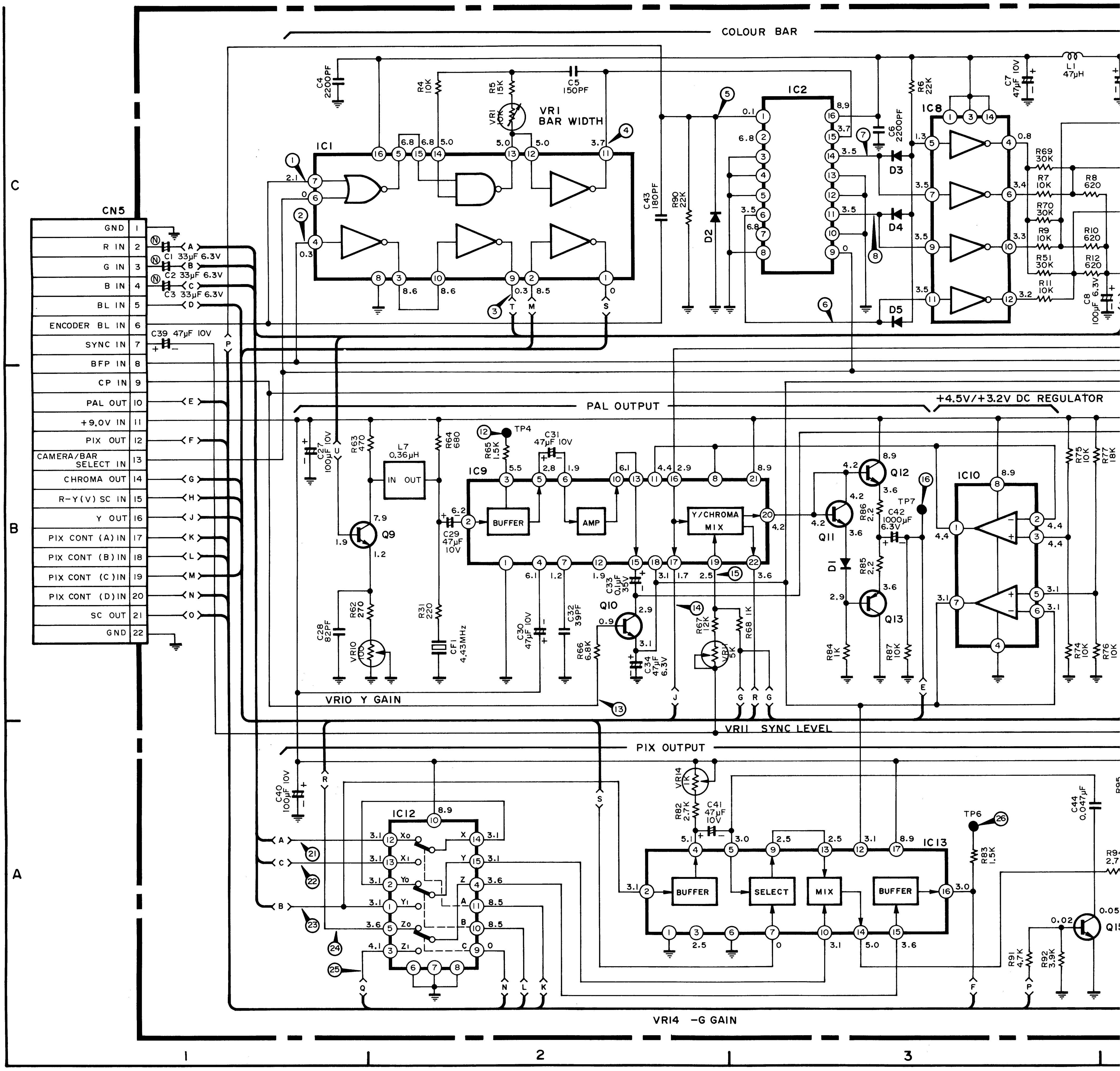

D
C
B
A
1
1
R71 680
R54 680
R55 680
R59 680
C28 47μF 10V
R65
R64
R87 82K
C31 10μF 16V
C1 47μF 10V
R62 82K
R39 1K
C16 10μF 16V
CN3
1
2
3
4
5
6
7
9
10
11
12
13
14
15
16
17
18
19
20
21
22
R14 220
R30
IN
R35 2.7K
R36 18K
R37 6.8K
C27 47μF 10V
Q10
VPRP77
CM

CONDUCTOR VIEW OF PROCESS-2 BOARD


VR 12
B GAMMA
VR 6
R GAMMA
VR 1
G GAMMA
VR 13
B GAIN
VR 7
R GAIN
VR 2
G GAIN
VR 14
B PEDESTAL
VR 8
R PEDESTAL
VR 3
G PEDESTAL
VR 15
B WHITE CLIP
VR 9
R WHITE CLIP
VR 4
G WHITE CLIP
VR 16
DETAIL NOISE
SUPPRESS
VR 10
H DETAIL LEVEL
VR 17
DETAIL GAIN
VR 11
H/V MIX
BALANCE
VR 5
V DETAIL
BALANCE
IC 7
IC 4
IC 1
IC 8
IC 5
IC 2
IC 9
IC 6
IC 3
Q 11
Q 12
Q 13
Q 14
Q 15
Q 7
Q 10
L 4
L 5
L 6
TP5
TP7
TP-GND
VPRP77702B
PROCESS-2
2
3

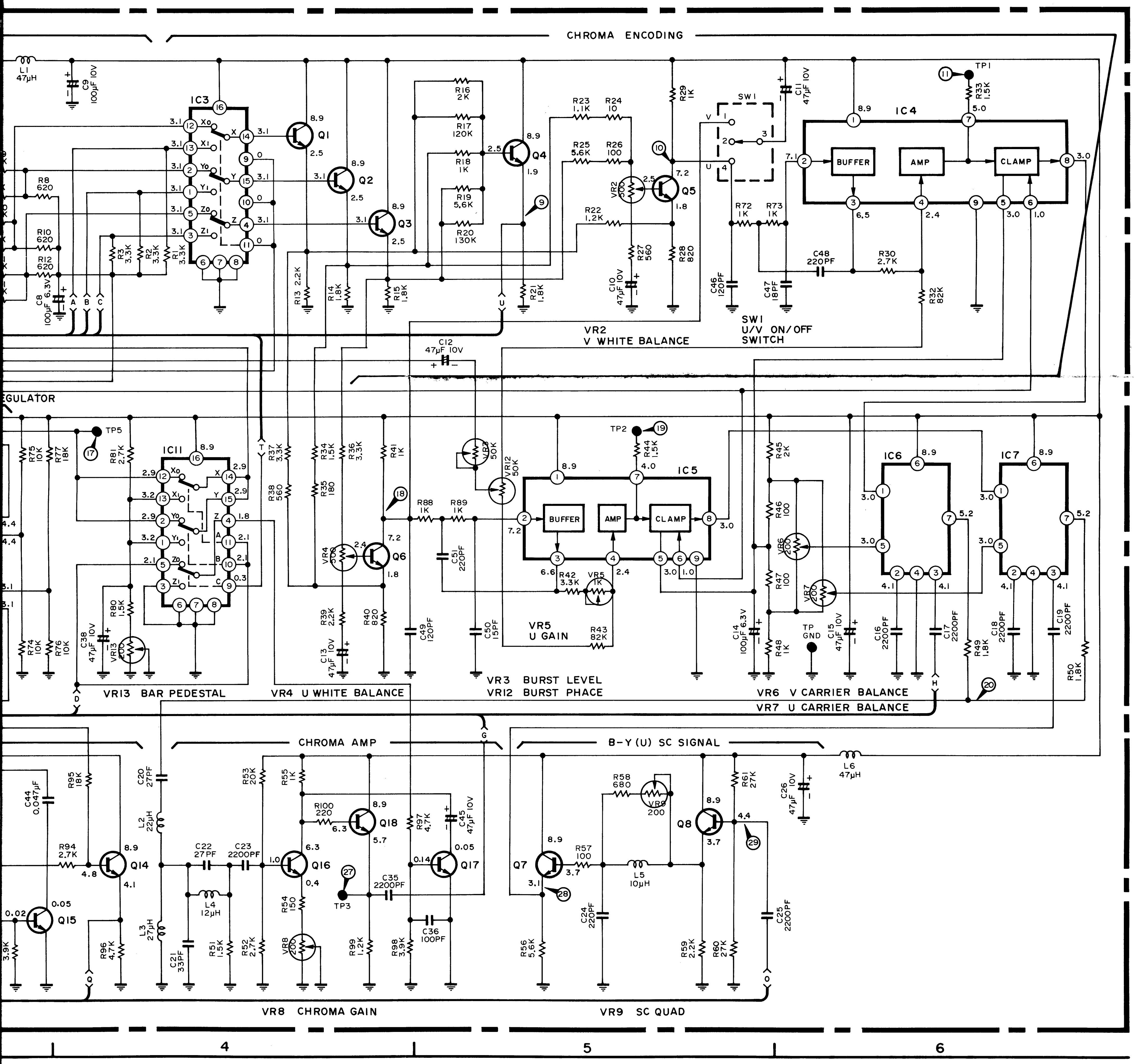
IC 1	EHMS935W73S	D1, D2, D3
IC 2	EHMS831W74S	C2, C3
IC 3	AN614	B3
IC 4	EHMS935W73S	D1, D2, D3
IC 5	EHMS831W74SA	C2, D2
IC 6	EHMSU31W70S	B2, B3
IC 7	EHMS935W73S	D1, D2, D3
IC 8	EHMS831W74SA	D2, D3
IC 9	AN608P	C3
Q 1	2SD636-RS	D2
Q 2	2SC641K-C	C2
Q 4	2SB641-QR	C2
Q 5	2SC2377-CD	A2
Q 6	2SC2377-CD	A2, A3
Q 7	2SD636-RS	A2
Q 8	2SD636-RS	D3
Q 9	2SC641K-C	C2
Q10	2SD636-RS	A1
Q11	2SD636-RS	D2
Q12	2SD636-RS	D3
Q13	2SC641K-C	C2, C3
Q14	2SD636-RS	B2
Q15	2SD636-RS	B2, C2
Q16	2SC641K-C	C2
D 1	MA26	B2
D 2	IS192E	B2
D 3	IS192E	B2

SCHEMATIC DIAGRAM


COLOUR BAR
PAL OUTPUT
PIX OUTPUT
+4.5V/+3.2V DC REGULATOR
VR1 BAR WIDTH
VR10 Y GAIN
VR11 SYNC LEVEL
VR14 -G GAIN
CN5
GND 1
R IN 2
G IN 3
B IN 4
BL IN 5
ENCODER BL IN 6
SYNC IN 7
BFP IN 8
CP IN 9
PAL OUT 10
+9.0V IN 11
PIX OUT 12
CAMERA/BAR SELECT IN 13
CHROMA OUT 14
R-Y(V) SC IN 15
Y OUT 16
PIX CONT (A) IN 17
PIX CONT (B) IN 18
PIX CONT (C) IN 19
PIX CONT (D) IN 20
SC OUT 21
GND 22
C1 33μF 6.3V
C2 33μF 6.3V
C3 33μF 6.3V
C39 47μF 10V
IC1
IC2
IC8
IC9
IC10
IC12
IC13
BUFFER
AMP
Y/CHROMA MIX
SELECT
MIX
C4 2200PF
R4 10K
R5 15K
C5 150PF
C43 180PF
R90 22K
D2
R6 22K
C6 2200PF
D3
D4
D5
C7 47μF 10V
L1 47μH
R69 30K
R7 10K
R8 620
R70 30K
R9 10K
R10 620
R51 30K
R12 620
R11 10K
C8 100μF 6.3V
C27 100μF 10V
R63 470
L7 0.36μH
R64 680
TP4
R65 1.5K
C31 47μF 10V
Q9
C29 47μF 10V
C28 82PF
R62 270
R31 220
CF1 4.43MHz
C30 47μF 10V
C32 39PF
C33 0.1μF 35V
Q10
R66 6.8K
C34 47μF 6.3V
R67 12K
R68 1K
Q11
Q12
Q13
D1
R86 2.2
R85 2.2
TP7
C42 1000μF 6.3V
R84 1K
R87 10K
R75 10K
R77 18K
R74 10K
R76 10K
C40 100μF 10V
R82 2.7K
C41 47μF 10V
TP6
R83 1.5K
C44 0.047μF
R91 4.7K
R92 3.9K
Q15
C
B
A
1
2
3

IC1	HD14572UBP	C1, C2	IC8	YWMC14050BCP	C3	Q1	2SD636-RS	C4	Q8	2SD636-RS	A
IC2	YWHD14516BP	C3	IC9	EHMS937H39S	B2	Q2	2SD636-RS	C4	Q9	2SD636-RS	B1
IC3	HD14053BP	C4	IC10	YHSNJM4558D	B3	Q3	2SD636-RS	C4	Q10	2SC641K-C	B
IC4	EHMSJ12H37S	C6	IC11	TC4053BP	B4	Q4	2SD636-RS	C5	Q11	2SD636-RS	B
IC5	EHMSJ12H37S	B5	IC12	HD14053BP	A2	Q5	2SD636-RS	C5	Q12	2SD638-QR	B
IC6	AN614	B6	IC13	EHMSU27H38S	A2, A3	Q6	2SD636-RS	B4	Q13	2SB643-QR	B
IC7	AN614	B6				Q7	2SD636-RS	A5	Q14	2SC2377-CD	A

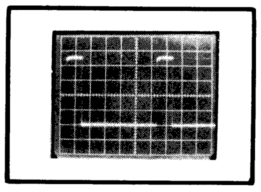
GRAM OF ENCODER BOARD


CHROMA ENCODING
L1 47μH
C9 100μF 10V
IC3
R8 620
R10 620
R12 620
C8 100μF 6.3V
R3 3.3K
R2 3.3K
R1 3.3K
Q1
Q2
Q3
R13 2.2K
R14 1.8K
R15 1.8K
R16 2K
R17 120K
R18 1K
R19 5.6K
R20 130K
Q4
R21 1.8K
R23 1.1K
R24 10
R25 5.6K
R26 100
R22 1.2K
VR2 500
Q5
R27 560
R28 820
C10 47μF 10V
R29 1K
C11 47μF 10V
SW1
SW1 U/V ON/OFF SWITCH
VR2 V WHITE BALANCE
R72 1K
R73 1K
C46 120PF
C47 18PF
C48 220PF
R30 2.7K
R32 82K
TP1
R33 1.5K
IC4
BUFFER
AMP
CLAMP
C12 47μF 10V
EGULATOR
TP5
R75 10K
R77 18K
R81 2.7K
IC11
R37 3.3K
R38 560
R34 1.5K
R35 180
R36 3.3K
R41 1K
VR3 50K
VR12 50K
R88 1K
R89 1K
C51 220PF
VR4 200
Q6
R39 2.2K
R40 820
C13 47μF 10V
C49 120PF
C50 15PF
TP2
R44 1.5K
IC5
BUFFER
AMP
CLAMP
R42 3.3K
VR5 1K
R43 82K
VR5 U GAIN
R80 1.5K
C38 47μF 10V
VR13 200
R74 10K
R76 10K
VR13 BAR PEDESTAL
VR4 U WHITE BALANCE
VR3 BURST LEVEL
VR12 BURST PHACE
R45 2K
R46 100
VR6 200
R47 100
VR7 200
R48 1K
C14 100μF 6.3V
TP GND
C15 47μF 10V
IC6
IC7
C16 2200PF
C17 2200PF
C18 2200PF
C19 2200PF
R49 1.8K
R50 1.8K
VR6 V CARRIER BALANCE
VR7 U CARRIER BALANCE
CHROMA AMP
C44 0.047μF
R95 18K
R94 2.7K
Q14
Q15
R96 4.7K
C20 27PF
L2 22μH
L3 27μH
C21 33PF
C22 27PF
C23 2200PF
L4 12μH
R51 1.5K
R52 2.7K
R53 20K
R55 1K
R100 220
Q18
Q16
R54 150
VR8 200
TP3
C35 2200PF
R99 1.2K
R97 4.7K
C45 47μF 10V
Q17
C36 100PF
R98 3.9K
VR8 CHROMA GAIN
B-Y (U) SC SIGNAL
Q7
R56 5.6K
R57 100
C24 220PF
L5 10μH
R58 680
VR9 200
Q8
R59 2.2K
R60 27K
R61 27K
C25 2200PF
C26 47μF 10V
L6 47μH
VR9 SC QUAD
4
5
6

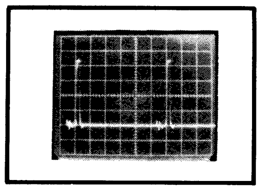
-RS	A5	Q15	2SC641K-C	A3	D1	MA165	B3
-RS	B1	Q16	2SD636-RS	A4	D2	MA165	C2
K-C	B2	Q17	2SC641K-C	A5	D3	MA165	C3
-RS	B3	Q18	2SD636-RS	A4	D4	MA165	C3
-QR	B3				D5	MA165	C3
-QR	B3						
7-CD	A4						

SIGNAL WAVEFORMS OF ENCODER BOARD

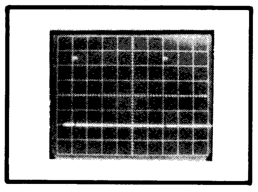
1 2V/DIV, 10µs/DIV



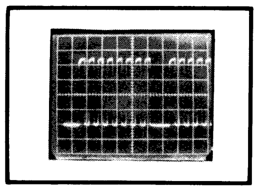
2 2V/DIV, 10µs/DIV



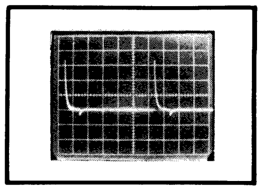
3 2V/DIV, 10µs/DIV



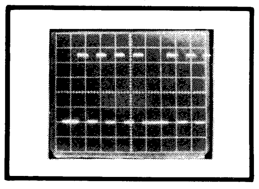
4 2V/DIV, 10µs/DIV



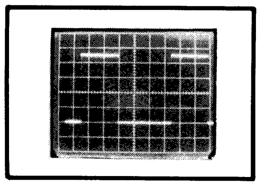
5 2V/DIV, 10µs/DIV



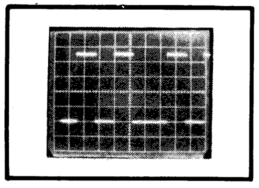
6 2V/DIV, 10µs/DIV



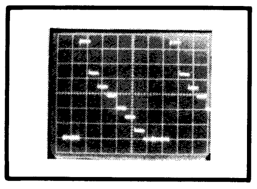
7 2V/DIV, 10µs/DIV



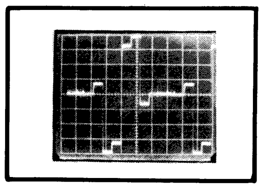
8 2V/DIV, 10µs/DIV



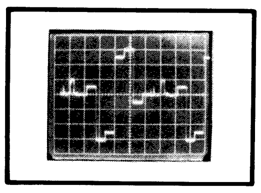
9 0.1V/DIV, 10µs/DIV



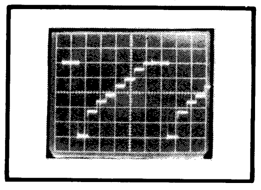
10 0.1V/DIV, 10µs/DIV



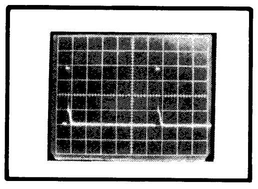
11 0.1V/DIV, 10µs/DIV



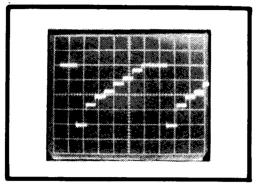
12 0.1V/DIV, 10µs/DIV



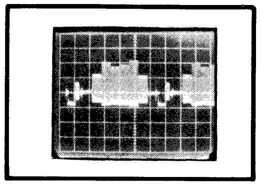
13 2V/DIV, 10µs/DIV



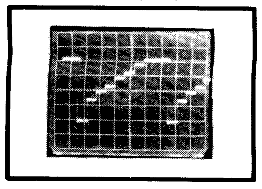
14 0.2V/DIV, 10µs/DIV



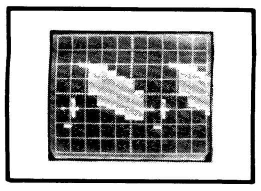
15 20mV/DIV, 10µs/DIV



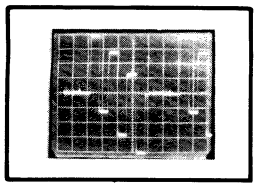
16 0.2V/DIV, 10µs/DIV



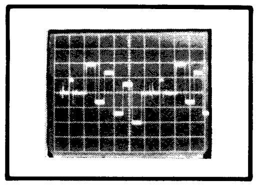
17 0.5V/DIV, 10µs/DIV



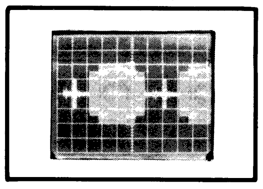
18 0.1V/DIV, 10µs/DIV



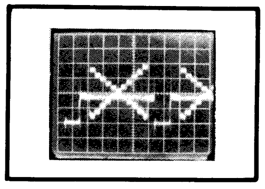
19 0.1V/DIV, 10µs/DIV



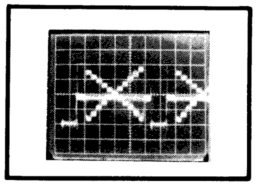
20 0.1V/DIV, 10µs/DIV



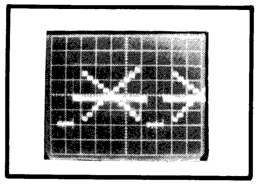
21 0.2V/DIV, 10µs/DIV



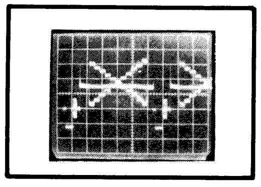
22 0.2V/DIV, 10µs/DIV



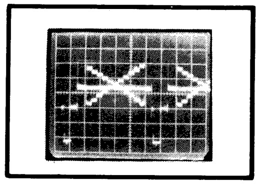
23 0.2V/DIV, 10µs/DIV



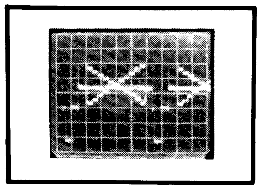
24 0.5V/DIV, 10µs/DIV



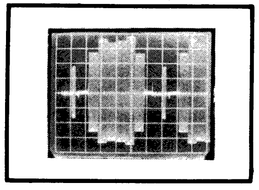
25 0.5V/DIV, 10µs/DIV



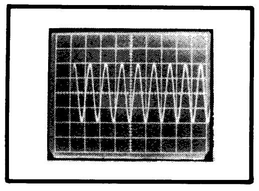
26 0.5V/DIV, 10µs/DIV



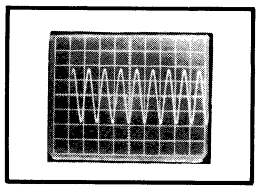
27 0.2V/DIV, 10µs/DIV



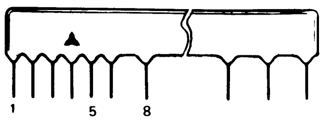
28 0.1V/DIV, 0.2µs/DIV



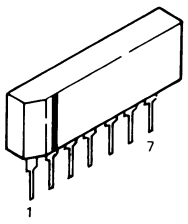
29 0.1V/DIV, 0.2µs/DIV



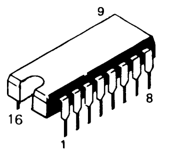
EHMS937H39S
EHMSJ12H37S
EHMSU27H38S



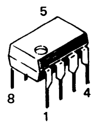
AN614



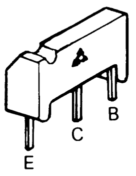
YWMC14050BCP
HD14572UBP
HD14053BP
TC4053BP
YWHD14516BP



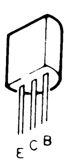
YHSNJM4558D



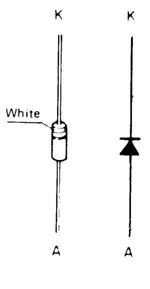
2SB643-QR
2SC2377-CD
2SD636-RS
2SD638-QR



2SC641K-C

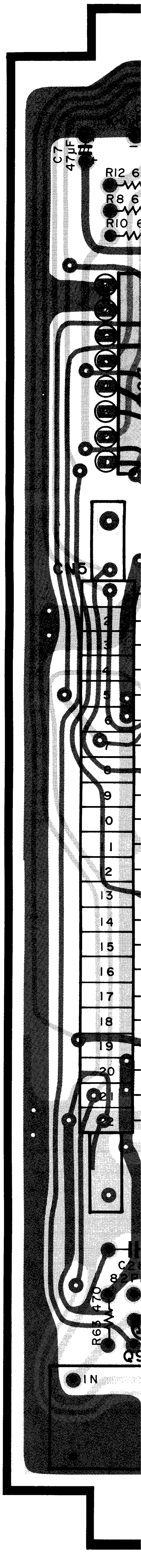


MA165



COND

CN5	
GND	1
R IN	2
G IN	3
B IN	4
BL IN	5
ENCODER BL IN	6
SYNC IN	7
BFP IN	8
CP IN	9
PAL OUT	10
+9.0V IN	11
PIX OUT	12
CAMERA/BAR SELECT IN	13
CHROMA OUT	14
R-Y(V)SC IN	15
Y OUT	16
PIX CONT (A) IN	17
PIX CONT (B) IN	18
PIX CONT (C) IN	19
PIX CONT (D) IN	20
SC OUT	21
GND	22


C7
47µF
R12 6
R8 6
R10 6
CN5
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
C
8
470
R63
Q9
IN

D

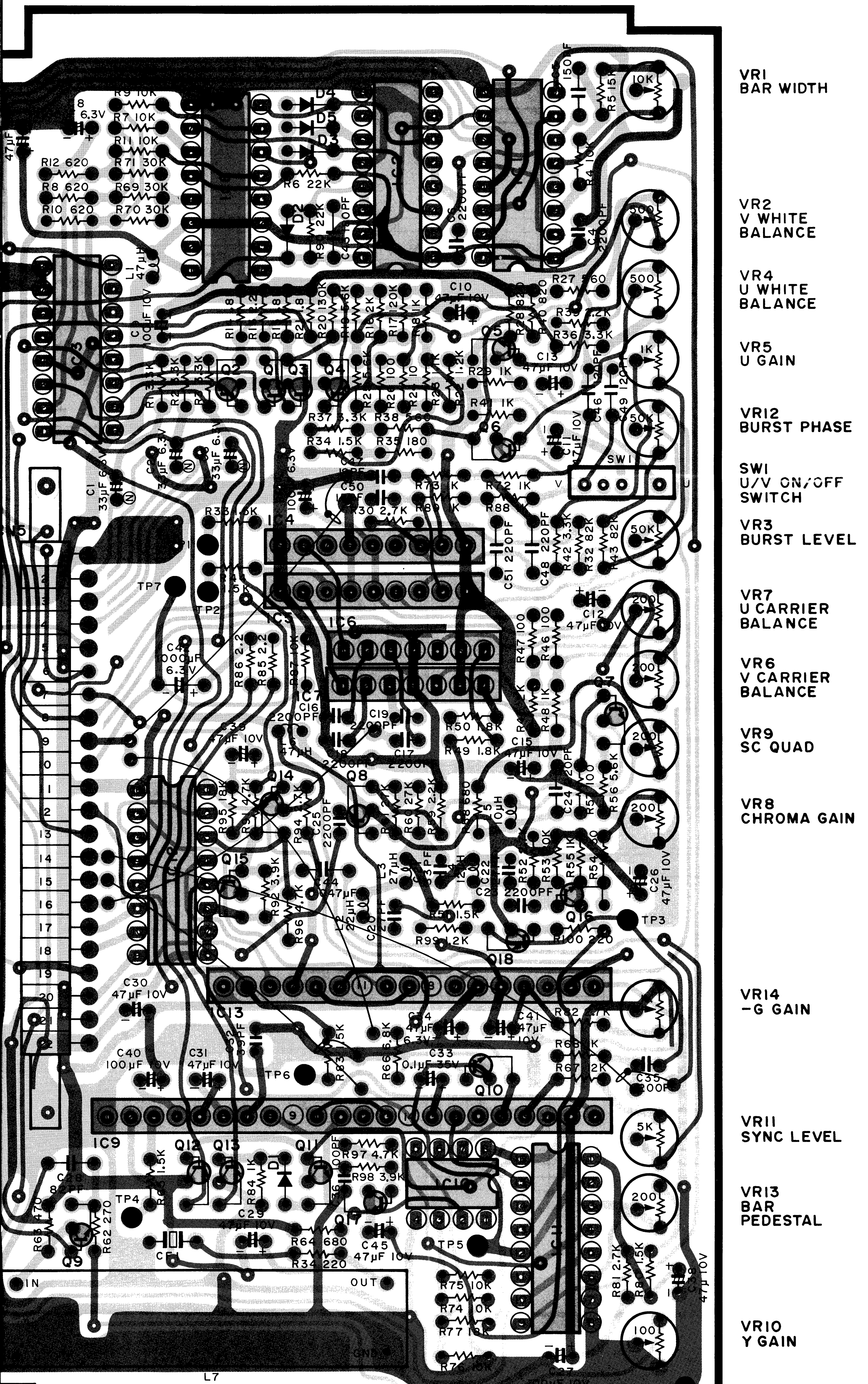
C

B

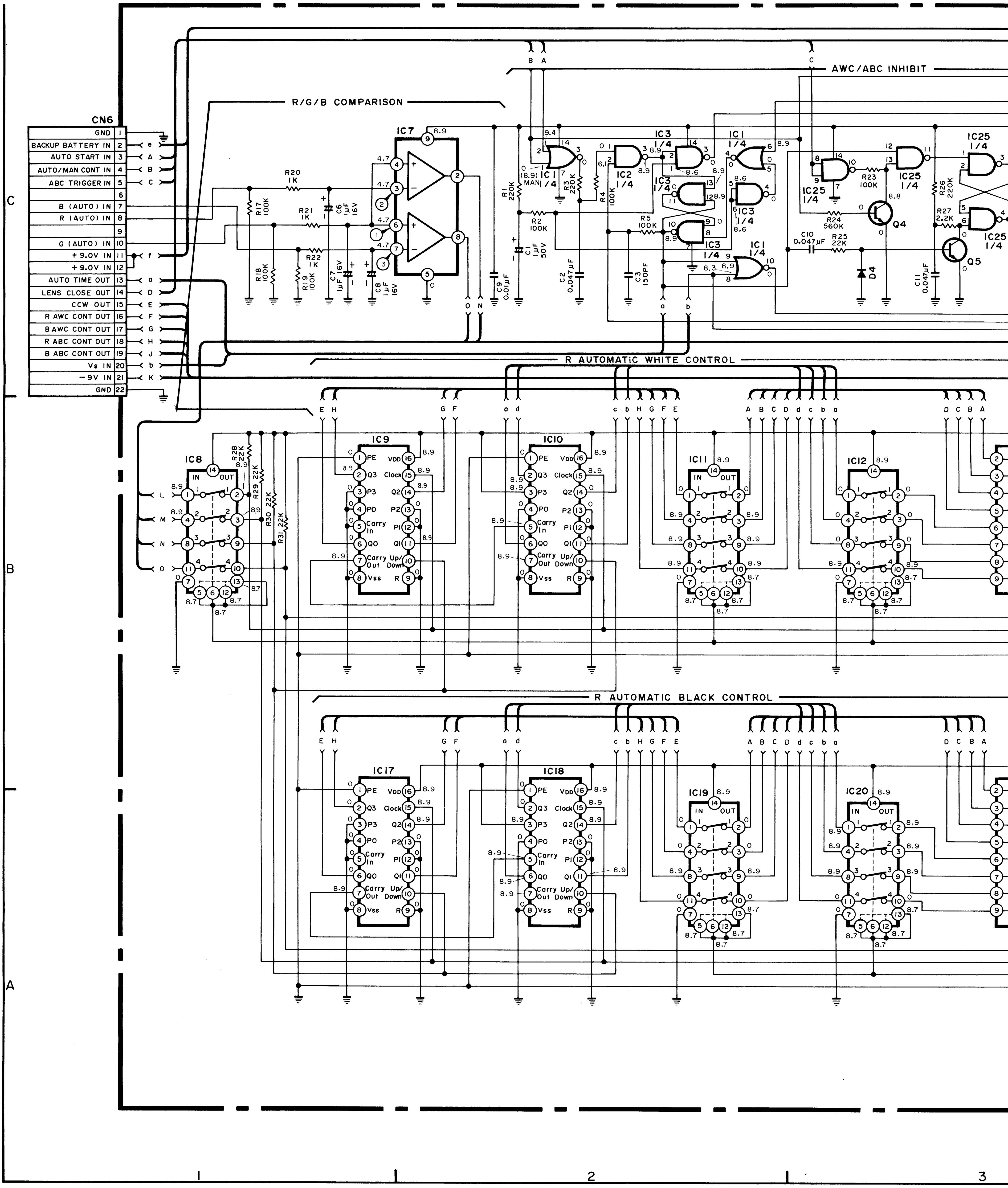
A

1

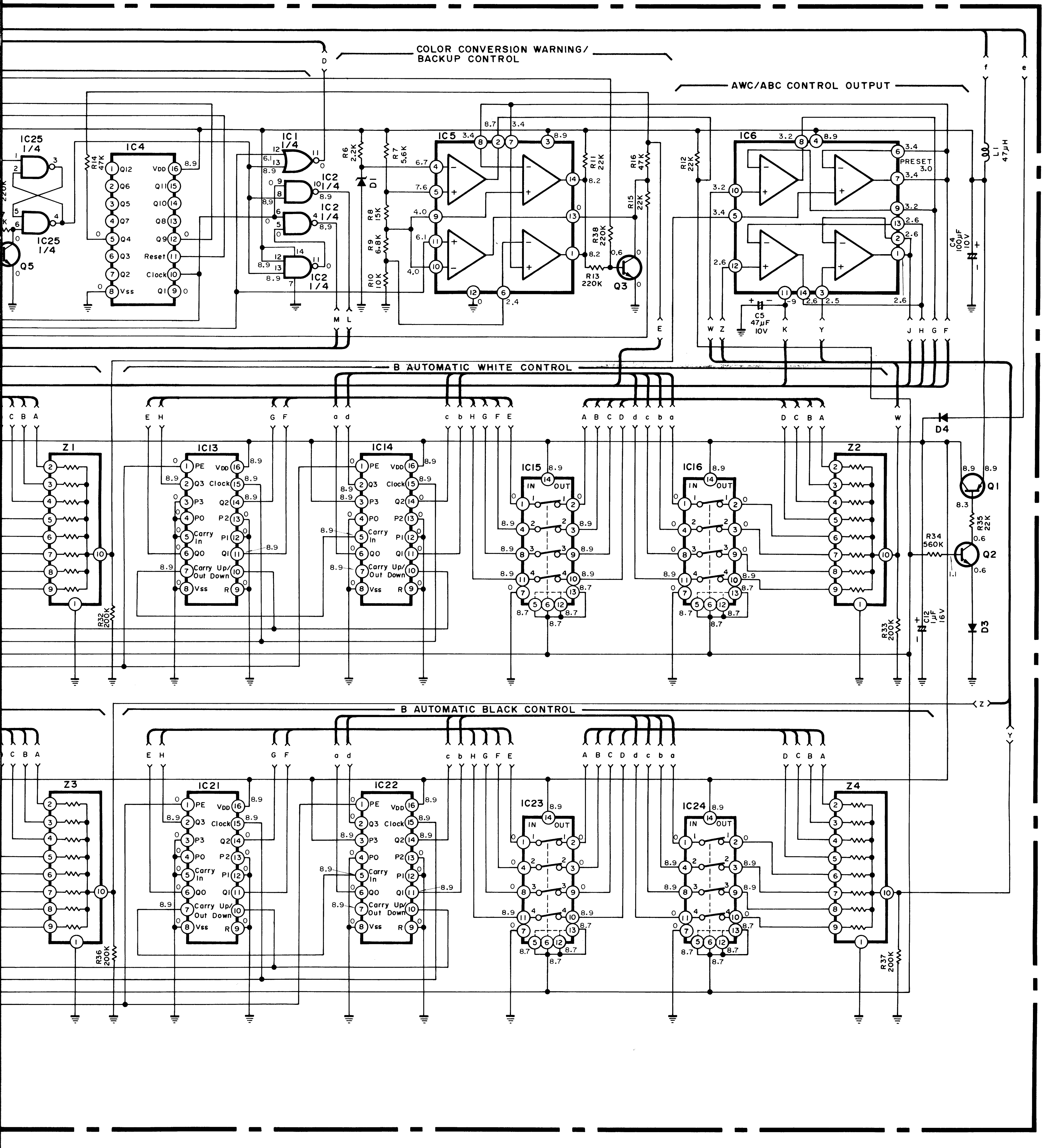
ONDUCTOR VIEW OF ENCODER BOARD


VR1
BAR WIDTH
VR2
V WHITE
BALANCE
VR4
U WHITE
BALANCE
VR5
U GAIN
VR12
BURST PHASE
SW1
U/V ON/OFF
SWITCH
VR3
BURST LEVEL
VR7
U CARRIER
BALANCE
VR6
V CARRIER
BALANCE
VR9
SC QUAD
VR8
CHROMA GAIN
VR14
-G GAIN
VR11
SYNC LEVEL
VR13
BAR
PEDESTAL
VR10
Y GAIN
IC4
IC5
IC6
IC7
IC9
IC10
IC11
IC13
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TPG
IN
OUT
GND
L7
MW-11941-0
VPBP1322A
2
3

IC1	HD14572UBP	D2, D3
IC2	YWHD14516BP	D2
IC3	HD14053BP	C1, C2, D1, D2
IC4	EHMSJ12H37S	C2
IC5	EHMSJ12H37S	C2
IC6	AN614	C2, C3
IC7	AN614	C2, C3
IC8	YWMC14050BCP	D2
IC9	EHMS937H39S	A2, A3, B2, B3
IC10	YHSNJM4558D	A2, A3
IC11	TC4053BP	A3
IC12	HD14053BP	B2
IC13	EHMSU27H38S	B2, B3
Q1	2SD636-RS	C2, D2
Q2	2SD636-RS	C2, D2
Q3	2SD636-RS	C2, D2
Q4	2SD636-RS	C2, D2
Q5	2SD636-RS	D2, D3
Q6	2SD636-RS	C2, C3
Q7	2SD636-RS	B3, C3
Q8	2SD636-RS	B2
Q9	2SD636-RS	A1, A2
Q10	2SC641K-C	B2, B3
Q11	2SD636-RS	A2
Q12	2SD638-QR	A2
Q13	2SB643-QR	A2
Q14	2SC2377-CD	B2
Q15	2SC641K-C	B2
Q16	2SD636-RS	B3
Q17	2SC641K-C	A2
Q18	2SD636-RS	B2, B3
D1	MA165	A2
D2	MA165	D2
D3	MA165	D2
D4	MA165	D2
D5	MA165	D2

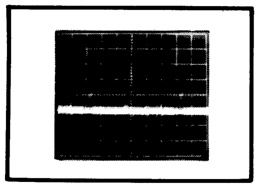

CN6
GND 1
BACKUP BATTERY IN 2
AUTO START IN 3
AUTO/MAN CONT IN 4
ABC TRIGGER IN 5
6
B (AUTO) IN 7
R (AUTO) IN 8
9
G (AUTO) IN 10
+9.0V IN 11
+9.0V IN 12
AUTO TIME OUT 13
LENS CLOSE OUT 14
CCW OUT 15
R AWC CONT OUT 16
B AWC CONT OUT 17
R ABC CONT OUT 18
B ABC CONT OUT 19
Vs IN 20
-9V IN 21
GND 22
R/G/B COMPARISON
AWC/ABC INHIBIT
IC7
R20 1K
R21 1K
R22 1K
R17 100K
R18 100K
R19 100K
C6 1µF 16V
C7 1µF 16V
C8 1µF 16V
C9 0.01µF
IC1 1/4
IC2 1/4
IC3 1/4
IC25 1/4
R1 220K
R2 100K
R3 220K
R4 100K
R5 100K
C1 1µF 50V
C2 0.047µF
C3 150PF
MAN
R23 100K
R24 560K
R25 22K
R26 220K
R27 2.2K
C10 0.047µF
C11 0.047µF
Q4
Q5
D4
R AUTOMATIC WHITE CONTROL
R AUTOMATIC BLACK CONTROL
IC8
R28 22K
R29 22K
R30 22K
R31 22K
IC9
IC10
IC11
IC12
IC17
IC18
IC19
IC20
IN
OUT
PE
Q3
P3
P0
Carry In
Q0
Carry Out
Vss
VDD
Clock
Q2
P2
P1
Q1
Up/Down
R
C
B
A
1
2
3

AGRAM OF AUTO BOARD

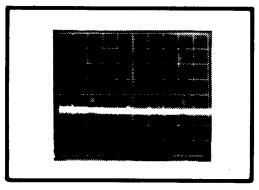

COLOR CONVERSION WARNING/ BACKUP CONTROL
AWC/ABC CONTROL OUTPUT
B AUTOMATIC WHITE CONTROL
B AUTOMATIC BLACK CONTROL
IC25 1/4
IC4
IC1 1/4
IC2 1/4
IC5
IC6
PRESET
Q5
Q3
Q1
Q2
D1
D3
D4
R6 2.2K
R7 5.6K
R8 15K
R9 6.8K
R10 10K
R11 22K
R12 22K
R13 220K
R14 47K
R15 22K
R16 47K
R38 220K
R32 200K
R33 200K
R34 560K
R35 22K
R36 200K
R37 200K
L1 47μH
C4 100μF 10V
C5 47μF 10V
C12 1μF 16V
Z1
Z2
Z3
Z4
IC13
IC14
IC15
IC16
IC21
IC22
IC23
IC24
PE
VDD
Q3
Clock
P3
Q2
PO
P2
Carry In
P1
QO
Q1
Carry Up/Out Down
Vss
R
Q12
Q11
Q6
Q10
Q5
Q8
Q7
Q9
Q4
Reset
IN
OUT
3
4
5

SIGNAL WAVEFORMS OF AUTO BOARD

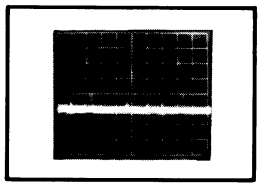
1 0.1V/DIV, 10μs/DIV



2 0.1V/DIV, 10μs/DIV

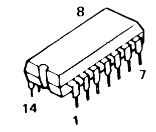


3 0.1V/DIV, 10μs/DIV

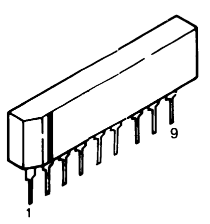


IC 1	YWHD14001BP	C2, C4
IC 2	YHD14011BP	C2, C4
IC 3	YHD14011BP	C2
IC 4	YWHD14040BP	C3
IC 5'	AN6912	C4
IC 6	HA17902P	C5
IC 7	AN6913	C2
IC 8	HD14066BP	B1
IC 9	YWHD14516BP	B1, B2
IC10	YWHD14516BP	B2
IC11	HD14066BP	B2
IC12	HD14066BP	B3
IC13	YWHD14516BP	B3
IC14	YWHD14516BP	B4
IC15	HD14066BP	B4
IC16	HD14066BP	B5
IC17	YWHD14516BP	A1, A2
IC18	YWHD14516BP	A2
IC19	HD14066BP	A2
IC20	HD14066BP	A3
IC21	YWHD14516BP	A3
IC22	YWHD14516BP	A4
IC23	HD14066BP	A4
IC24	HD14066BP	A5
IC25	HD14011BP	C3
Q 1	2SB641-RS	B5
Q 2	2SD636-RS	B5
Q 3	2SD636-RS	C4
Q 4	2SD636-RS	C3
Q 5	2SD636-RS	C3
D 1	YUDXZ068	C4
D 2	MA165	B5
D 3	MA165	B5
D 4	MA165	C3

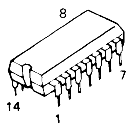
AN6912



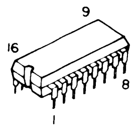
AN6913



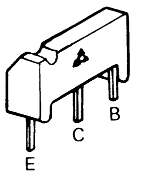
HA17902D
HD14011BP
HD14066BP
YWHD14001BP
YHD14011BP



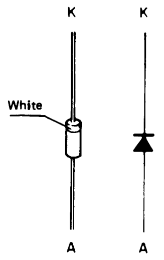
YWHD14040BP
YWHD14516BP



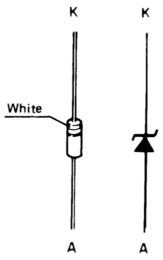
2SB641-RS
2SD636-RS



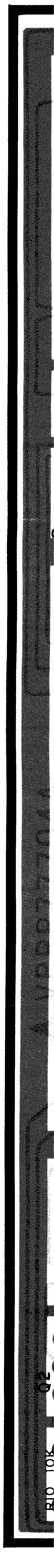
MA165



YUDX2068



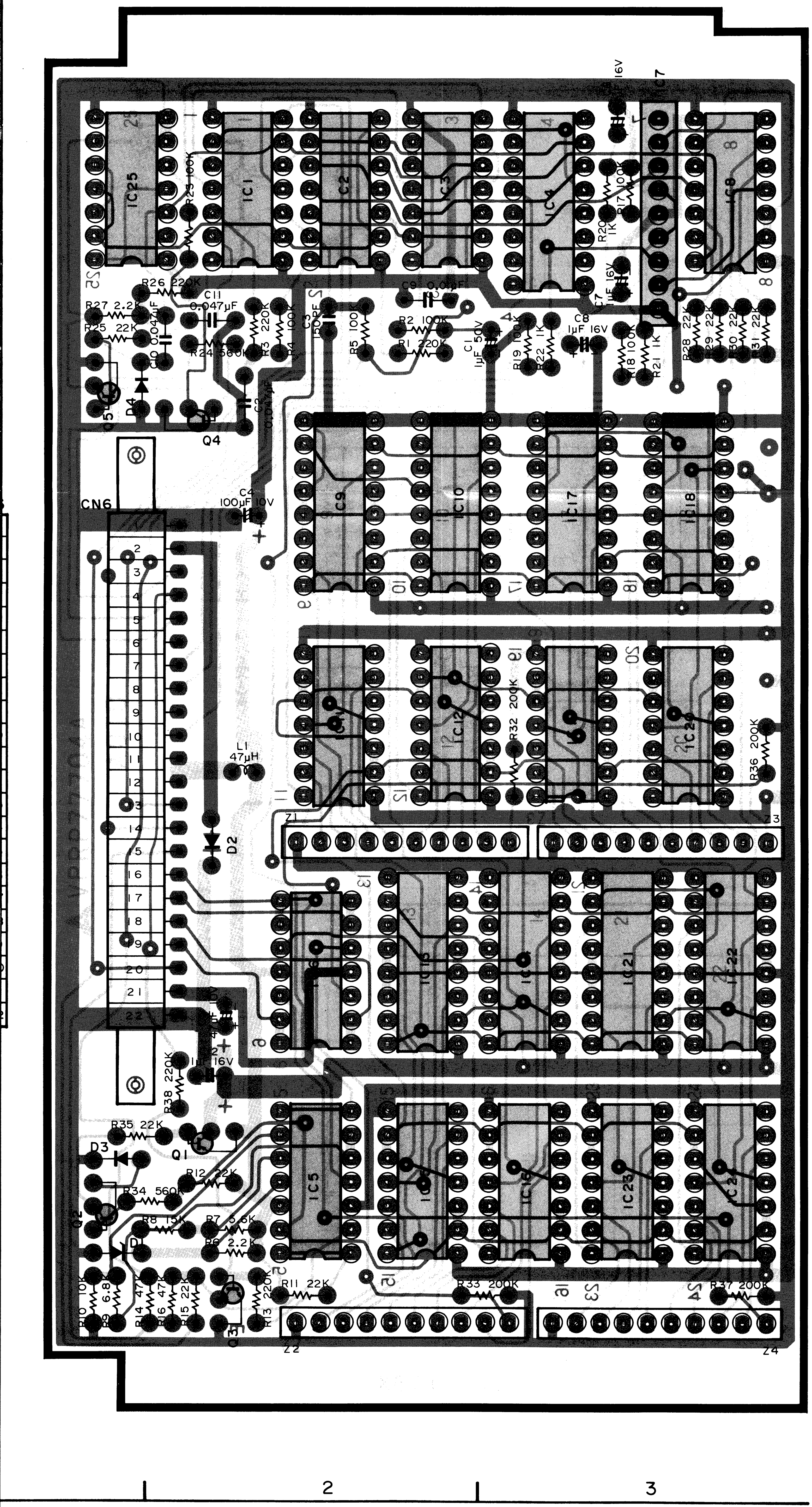
CONDUCT



CN6

GND	1
BACKUP BATTERY IN	2
AUTO START IN	3
AUTO/MAN CONT IN	4
ABC TRIGGER IN	5
	6
B AUTO IN	7
R AUTO IN	8
	9
G AUTO IN	10
+9.0V IN	11
+9.0V IN	12
AUTO TIME OUT	13
LENS CLOSE OUT	14
CCW OUT	15
R AWC CONT OUT	16
B AWC CONT OUT	17
R ABC CONT OUT	18
B ABC CONT OUT	19
Vs IN	20
−9V IN	21
GND	22

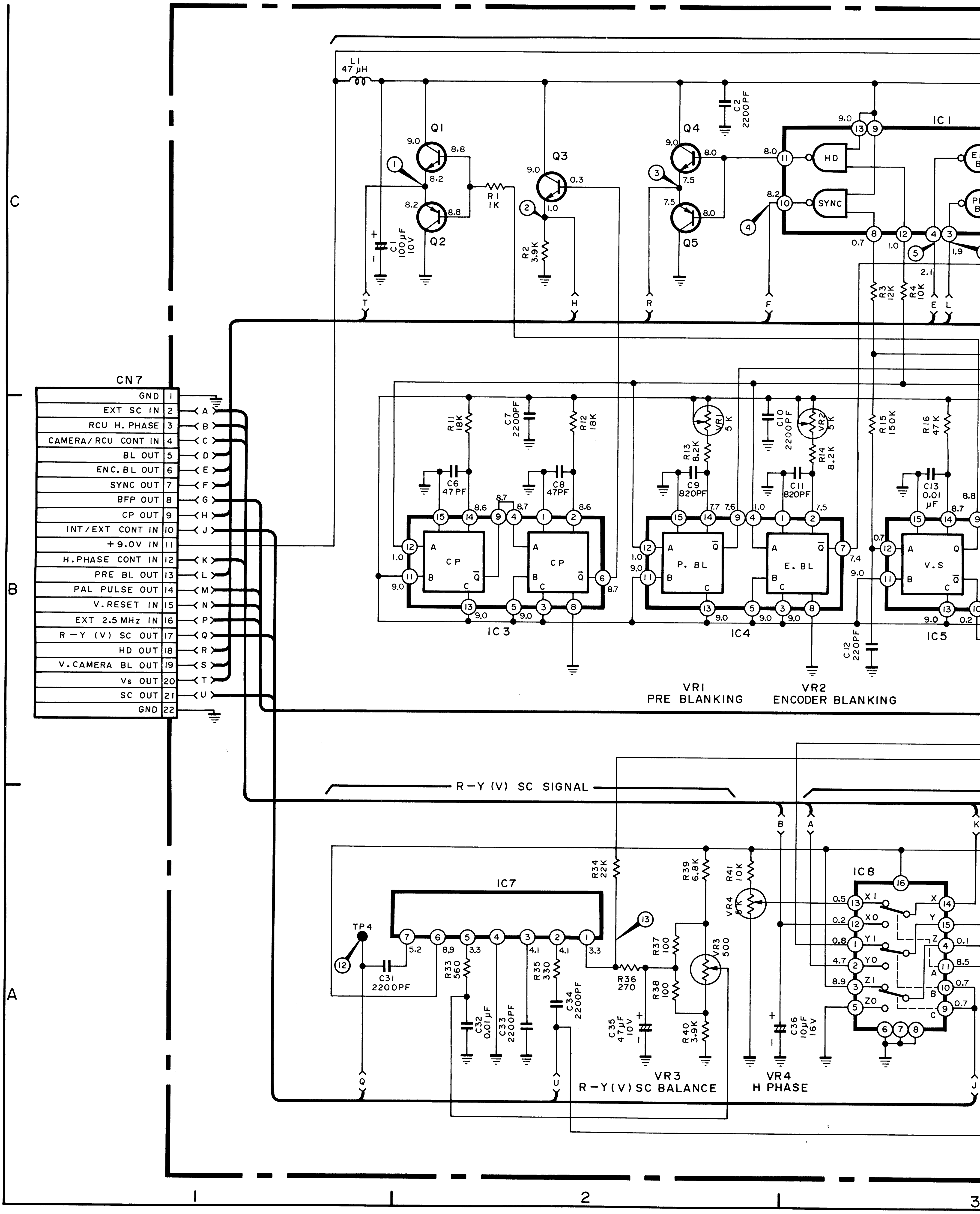
DUCTOR VIEW OF AUTO BOARD



IC25
IC1
IC2
IC3
IC4
IC7
IC8
R23 100K
R26 220K
R27 2.2K
R25 22K
C11 0.047μF
C10 0.047μF
R24 560K
R3 220K
R4 100K
C3 150PF
R5 100
C9 0.047μF
R2 100K
R1 220K
C1 1μF 50V
R19 100K
R22 1K
C8 1μF 16V
R18 100K
R21 1K
R17 100K
R20 1K
C7 1μF 16V
16V
R28 22K
R29 22K
R30 22K
R31 22K
Q5
D4
Q4
C2 0.047μF
CN6
C4 100μF 10V
IC9
IC10
IC17
IC18
IC11
IC12
IC19
IC20
R32 200K
R36 200K
L1 47μH
Z1
Z3
D2
IC6
IC13
IC14
IC21
IC22
C6 1μF 16V
R38 220K
R35 22K
D3
Q1
R12 22K
R34 560K
Q2
R8 15K
R7 5.6K
R6 2.2K
D1
IC5
IC15
IC16
IC23
IC24
R10 10K
R9 6.8K
R14 47K
R16 47K
R15 22K
Q3
R13 220K
R11 22K
R33 200K
R37 200K
Z2
Z4
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
1
2
3

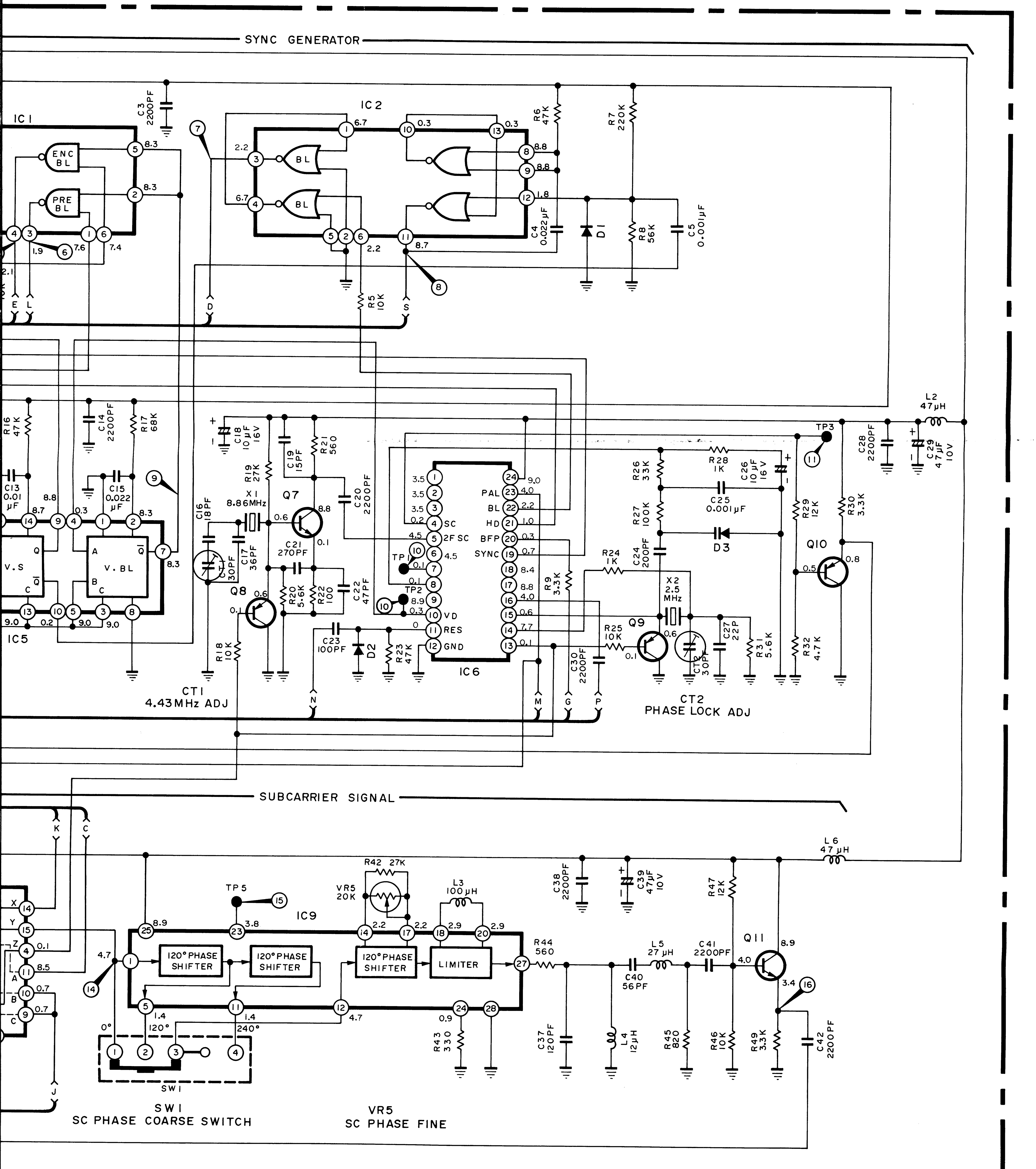
IC1	YWHD14001BP	D2
IC2	YHD14011BP	D2
IC3	YHD14011BP	D2, D3
IC4	YWHD14040BP	D3
IC5	AN6912	A2, B2
IC6	HA17902P	B2
IC7	AN6913	D3
IC8	HD14066BP	D3
IC9	YWHD14516BP	C2
IC10	YWHD14516BP	C2, C3
IC11	HD14066BP	B2, C2
IC12	HD14066BP	B2, C2
IC13	YWHD14516BP	B2
IC14	YWHD14516BP	B3
IC15	HD14066BP	A2, B2
IC16	HD14066BP	A3, B3
IC17	YWHD14516BP	C3
IC18	YWHD14516BP	C3
IC19	HD14066BP	B3, C3
IC20	HD14066BP	B3, C3
IC21	YWHD14516BP	B3
IC22	YWHD14516BP	B3
IC23	HD14066BP	A3, B3
IC24	HD14066BP	A3, B3
IC25	HD14011BP	D1, D2
Q1	2SB641-RS	A2
Q2	2SD636-RS	A1
Q3	2SD636-RS	A2
Q4	2SD636-RS	C2
Q5	2SD636-RS	C1, D1
D1	YUDXZ068	A1
D2	MA165	B2
D3	MA165	A1
D4	MA165	C1, D1

SCHEMATIC DIAGRA


CN7
GND 1
EXT SC IN 2
RCU H. PHASE 3
CAMERA/RCU CONT IN 4
BL OUT 5
ENC. BL OUT 6
SYNC OUT 7
BFP OUT 8
CP OUT 9
INT/EXT CONT IN 10
+9.0V IN 11
H. PHASE CONT IN 12
PRE BL OUT 13
PAL PULSE OUT 14
V. RESET IN 15
EXT 2.5MHz IN 16
R-Y (V) SC OUT 17
HD OUT 18
V. CAMERA BL OUT 19
Vs OUT 20
SC OUT 21
GND 22
L1 47μH
Q1
Q2
Q3
Q4
Q5
R1 1K
R2 3.9K
C1 100μF 10V
C2 2200PF
IC1
HD
SYNC
IC3
IC4
IC5
CP
P. BL
E. BL
V.S
R11 18K
R12 18K
C7 2200PF
C6 47PF
C8 47PF
R13 8.2K
VR1 5K
C9 820PF
C10 2200PF
VR2 5K
R14 8.2K
C11 820PF
R3 12K
R4 10K
R15 150K
R16 47K
C13 0.01μF
C12 220PF
VR1
PRE BLANKING
VR2
ENCODER BLANKING
R-Y (V) SC SIGNAL
IC7
TP4
C31 2200PF
R33 560
C32 0.01μF
C33 2200PF
R35 330
C34 2200PF
R34 22K
R36 270
R37 100
R38 100
C35 47μF 10V
R39 6.8K
VR3 500
R40 3.9K
R41 10K
VR4 5K
C36 10μF 16V
VR3
R-Y (V) SC BALANCE
VR4
H PHASE
IC8
X1
X0
Y1
Y0
Z1
Z0
X
Y
Z
A
B
C
C
B
A
1
2
3

IC1	HD14011BP	C3	IC6	MN6065	B4	Q1	2SD636-RS	C2	Q7	2SC828-QR	B4
IC2	YWHD14001BP	C4	IC7	AN614	A2	Q2	2SB641-RS	C2	Q8	2SB643-QR	B4
IC3	TC4538BP	B2	IC8	HD14053BP	A3	Q3	2SD636-RS	C2	Q9	2SB643-QR	B5
IC4	YWHD14538BP	B2, B3	IC9	EHMS653C10S	A3, A4	Q4	2SD636-RS	C2	Q10	2SB641-RS	B5
IC5	YWHD14538BP	B3				Q5	2SB641-RS	C2	Q11	2SD636-RS	A5

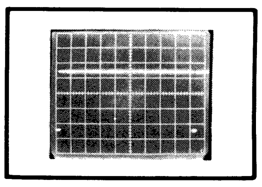
AGRAM OF SYNC-1 BOARD


SYNC GENERATOR
IC1
ENC BL
PRE BL
C3 2200PF
IC2
BL
R6 47K
R7 220K
C4 0.022μF
D1
R8 56K
C5 0.001μF
R5 10K
E
L
D
S
R16 47K
C14 2200PF
R17 68K
C13 0.01 μF
C15 0.022 μF
V.S
V.BL
IC5
C18 10μF 16V
C19 15PF
R21 560
R19 27K
X1 8.86MHz
Q7
C16 18PF
C17 36PF
CT1 30PF
C20 2200PF
C21 270PF
R20 5.6K
R22 100
C22 47PF
Q8
R18 10K
CT1 4.43MHz ADJ
C23 100PF
D2
R23 47K
IC6
SC
2F SC
VD
RES
GND
PAL
BL
HD
BFP
SYNC
TP1
TP2
TP3
R9 3.3K
C30 2200PF
N
M
G
P
R26 33K
R28 1K
C26 10μF 16V
C25 0.001μF
R27 100K
D3
C24 200PF
R24 1K
X2 2.5 MHz
R25 10K
Q9
CT2 30PF
C27 22P
R31 5.6K
R29 12K
R30 3.3K
R32 4.7K
Q10
C28 2200PF
C29 47μF 10V
L2 47μH
CT2 PHASE LOCK ADJ
SUBCARRIER SIGNAL
K
C
J
TP5
IC9
R42 27K
VR5 20K
L3 100μH
120° PHASE SHIFTER
120° PHASE SHIFTER
120° PHASE SHIFTER
LIMITER
R44 560
R43 330
C38 2200PF
C39 47μF 10V
R47 12K
L6 47 μH
Q11
L5 27 μH
C41 2200PF
C40 56PF
C37 120PF
L4 12μH
R45 820
R46 10K
R49 3.3K
C42 2200PF
0°
120°
240°
SW1
SW1 SC PHASE COARSE SWITCH
VR5 SC PHASE FINE
3
4
5

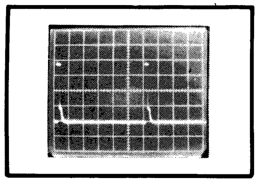
B4	D1	MA165	C4
B4	D2	MA165	B4
B5	D3	YUD1S2139C	B5
B5			
A5			

SIGNAL WAVEFORMS OF SYNC-1 BOARD

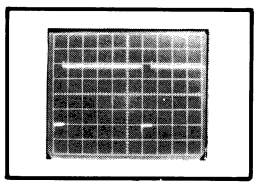
1 2V/DIV, 2ms/DIV



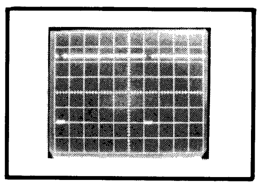
2 2V/DIV, 10μs/DIV



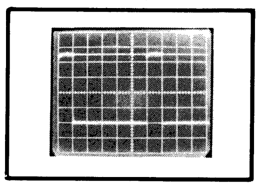
3 2V/DIV, 10μs/DIV



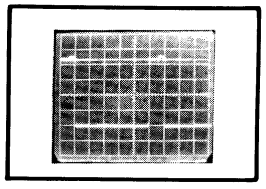
4 2V/DIV, 10μs/DIV



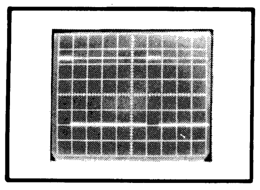
5 2V/DIV, 10μs/DIV



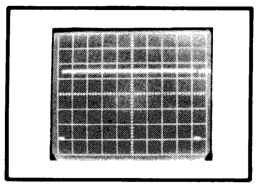
6 2V/DIV, 10μs/DIV



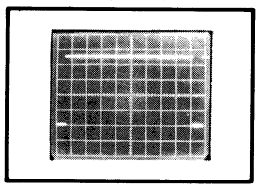
7 2V/DIV, 10μs/DIV



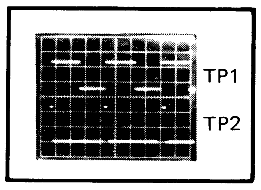
8 2V/DIV, 2ms/DIV



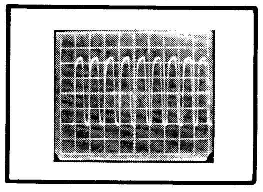
9 2V/DIV, 2ms/DIV



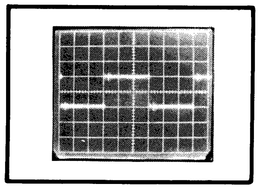
10 5V/DIV, 5ms/DIV



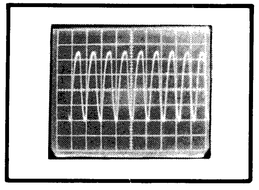
11 2V/DIV, 0.2μs/DIV



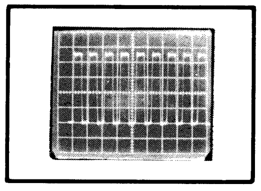
12 50mV/DIV, 20μs/DIV



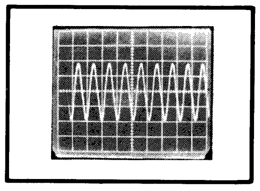
13 0.5V/DIV, 0.2μs/DIV



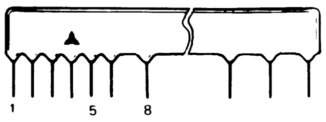
14 0.5V/DIV, 0.2μs/DIV



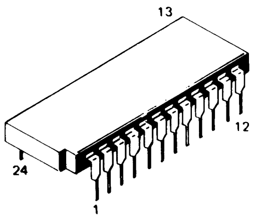
15 0.1V/DIV, 0.2μs/DIV



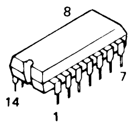
EHMS653C10S



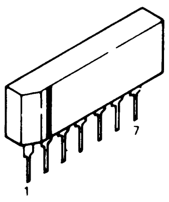
MN6065



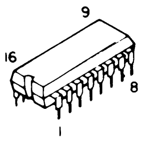
HD14011BP
YWHD14001BP



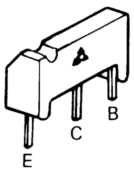
AN614



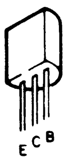
TC4538BP
HD14053BP
YFHD14557BP
YWHD14538BP



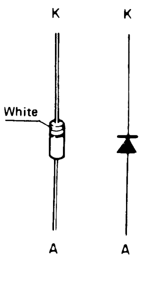
2SB641-RS
2SB643-QR
2SD636-RS



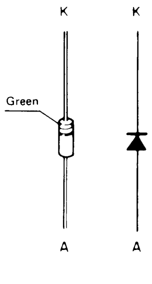
2SC828-QR



MA165



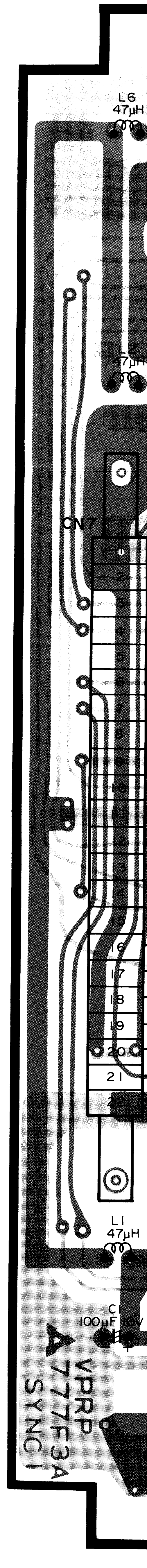
YUD1S2139C



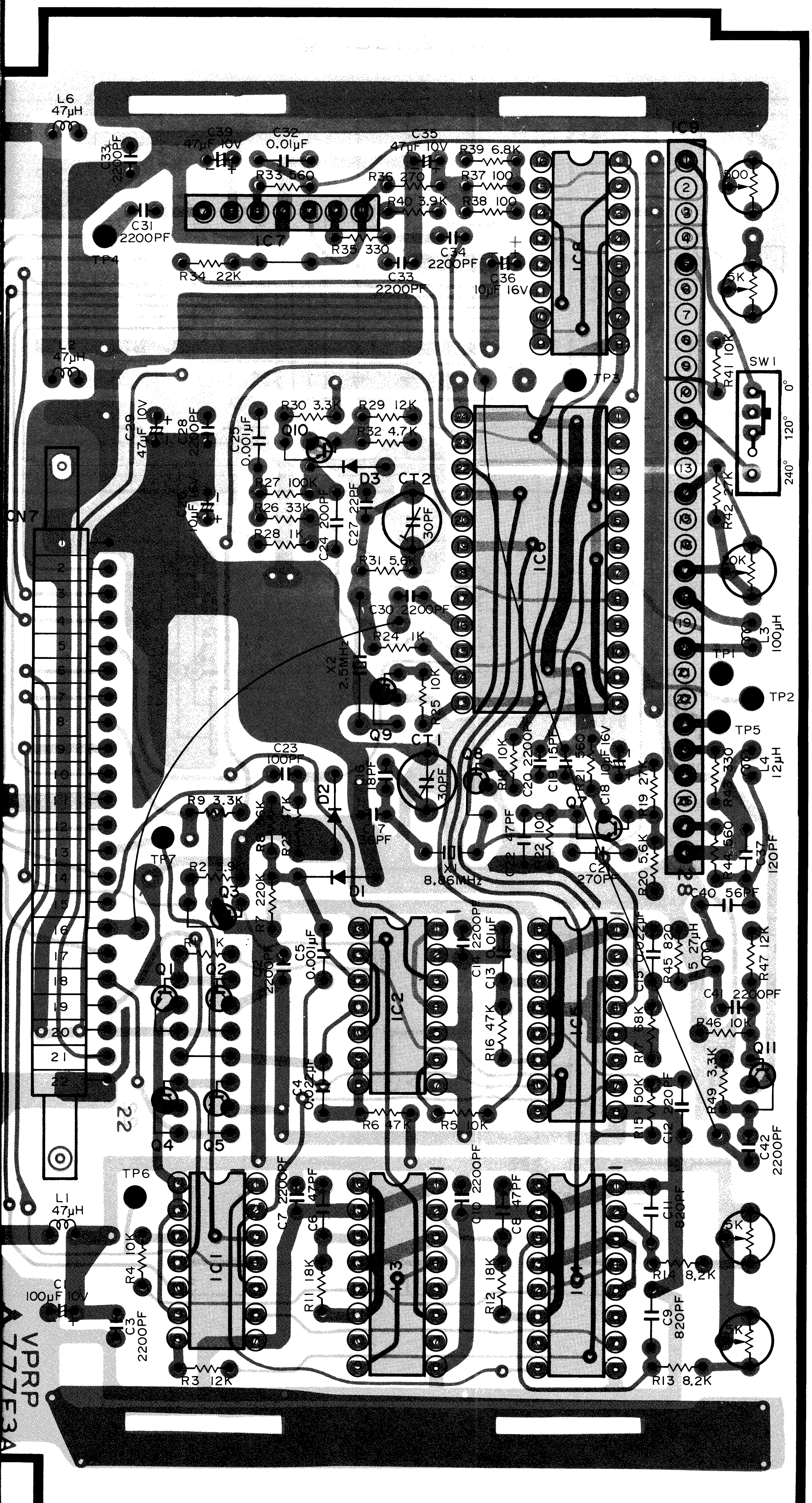
CONDUCTO

CN 7

GND	1
EXT SC IN	2
PCU H. PHASE	3
CAMERA/RCU CONT IN	4
BL OUT	5
ENC. BL OUT	6
SYNC OUT	7
BFP OUT	8
CP OUT	9
INT/EXT CONT IN	10
+9.0V IN	11
H. PHASE CONT IN	12
PRE BL OUT	13
PAL PULSE OUT	14
V. RESET IN	15
EXT 2.5MHz IN	16
R-Y(V) SC OUT	17
HD OUT	18
V. CAMERA BL OUT	19
Vs OUT	20
SC OUT	21
GND	22


D
C
B
A
1
L6
47μH
47μH
CN7
L1
47μH
C1
100μF 10V
VPRP
777F3A
SYNC 1

UCTOR VIEW OF SYNC-1 BOARD


L6 47μH
C33 2200PF
C39 47μF 10V
C32 0.01μF
C35 47μF 10V
R39 6.8K
R33 560
R36 270
R37 100
R40 3.9K
R38 100
C31 2200PF
TP4
IC7
R35 330
C34 2200PF
C36 10μF 16V
R34 22K
C33 2200PF
IC8
IC9
VR3 500
VR4 5K
R41 10K
SW1
0°
120°
240°
TP3
C29 47μF 10V
C28 2200PF
C25 0.001μF
R30 3.3K
R29 12K
Q10
R32 4.7K
D3
CT2
30PF
R27 100K
R26 33K
R28 1K
C24 200PF
C27 22PF
R42 27K
VR5 10K
CN7
R31 5.6K
IC6
C30 2200PF
R24 1K
X2 2.5MHz
R25 10K
L3 100μH
TP1
TP2
TP5
Q9
CT1
30PF
C23 100PF
R9 3.3K
D2
Q8
Q7
R19 27K
L4 12μH
R43 330
R44 560
C37 120PF
TP7
R2
Q3
R7 220K
D1
X1 8.86MHz
C22 270PF
R20 5.6K
C40 56PF
C2 2200PF
C5 0.001μF
IC2
C14 2200PF
C13 0.01μF
IC5
R45 820
L5 27μH
R47 12K
Q1
Q2
C41 2200PF
R46 10K
Q11
R16 47K
R17 68K
R49 3.3K
C4 0.022μF
R6 47K
R5 10K
R15 50K
C12 220PF
C42 2200PF
Q4
Q5
TP6
L1 47μH
C7 2200PF
C6 47PF
C10 2200PF
C8 47PF
C11 820PF
VR2 5K
R4 10K
IC1
R11 18K
IC3
R12 18K
IC4
R14 8.2K
C1 100μF 10V
C3 2200PF
C9 820PF
VR1 5K
R3 12K
R13 8.2K
VPRP
777E3A
22
2
3

VR 3
R−Y (V)
SC BALANCE

VR4
H PHASE

SW1
SC PHASE
COARSE
SWITCH

CT2
PHASE LOCK
ADJ

VR5
SC PHASE
FINE

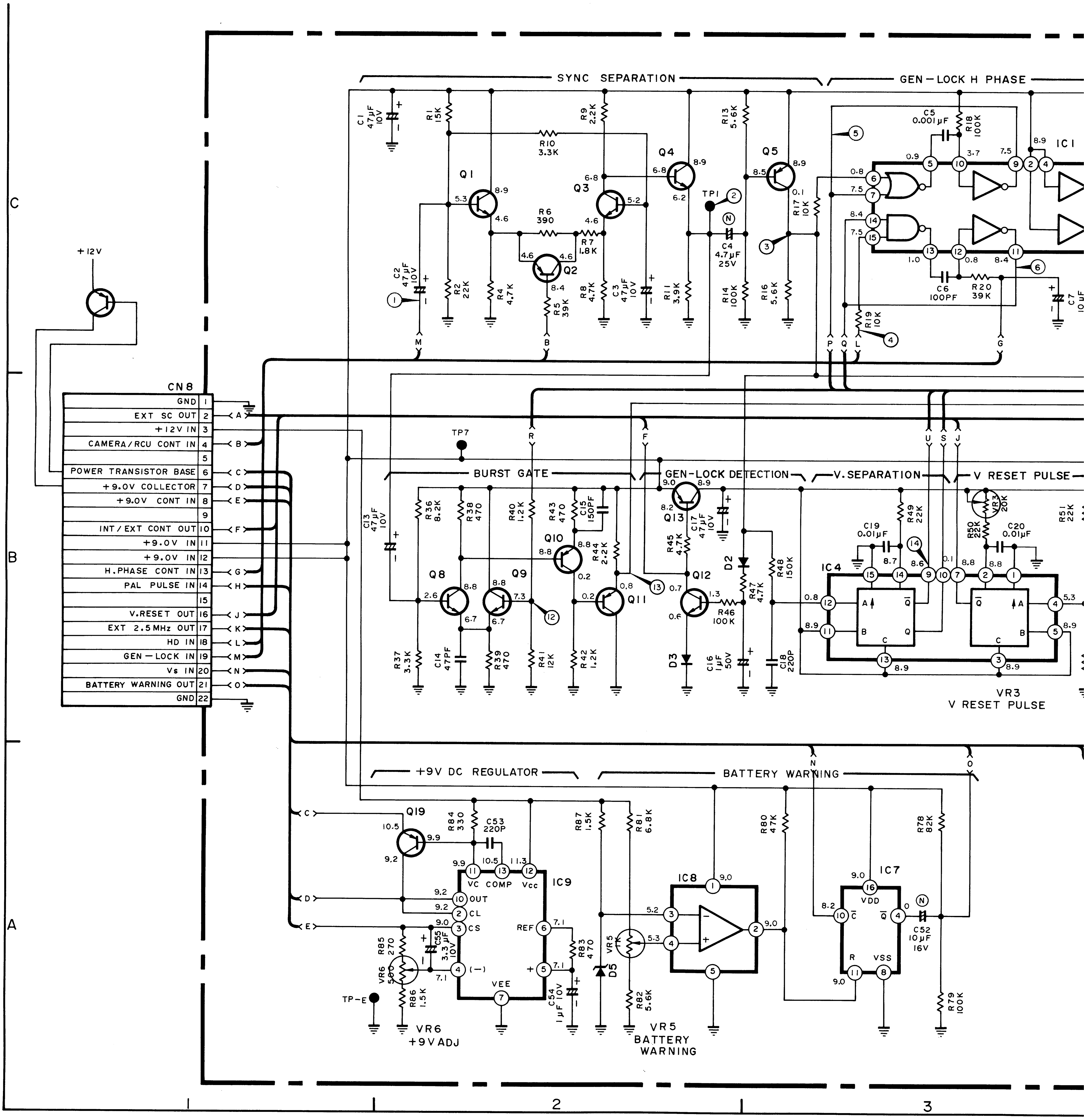
CT1
4.43MHz
ADJ

VR2
ENCODER
BLANKING

VR1
PRE
BLANKING

IC1	HD14011BP	A2, B2
IC2	YWHD14001BP	B2
IC3	TC4538BP	A2, B2
IC4	YWHD14538BP	A3, B3
IC5	YWHD14538BP	B3
IC6	MN6065	C2, C3
IC7	AN614	D2
IC8	HD14053BP	D3
IC9	EHMS653C10S	B3, C3, D3
Q1	2SD636-RS	B2
Q2	2SB641-RS	B2
Q3	2SD636-RS	B2
Q4	2SD636-RS	B2
Q5	2SB641-RS	B2
Q7	2SC828-QR	B3
Q8	2SB643-QR	B2, C2
Q9	2SB643-QR	C2
Q10	2SB641-RS	C2
Q11	2SD636-RS	B3
D1	MA165	B2
D2	MA165	B2, C2
D3	YUD1S2139C	C2

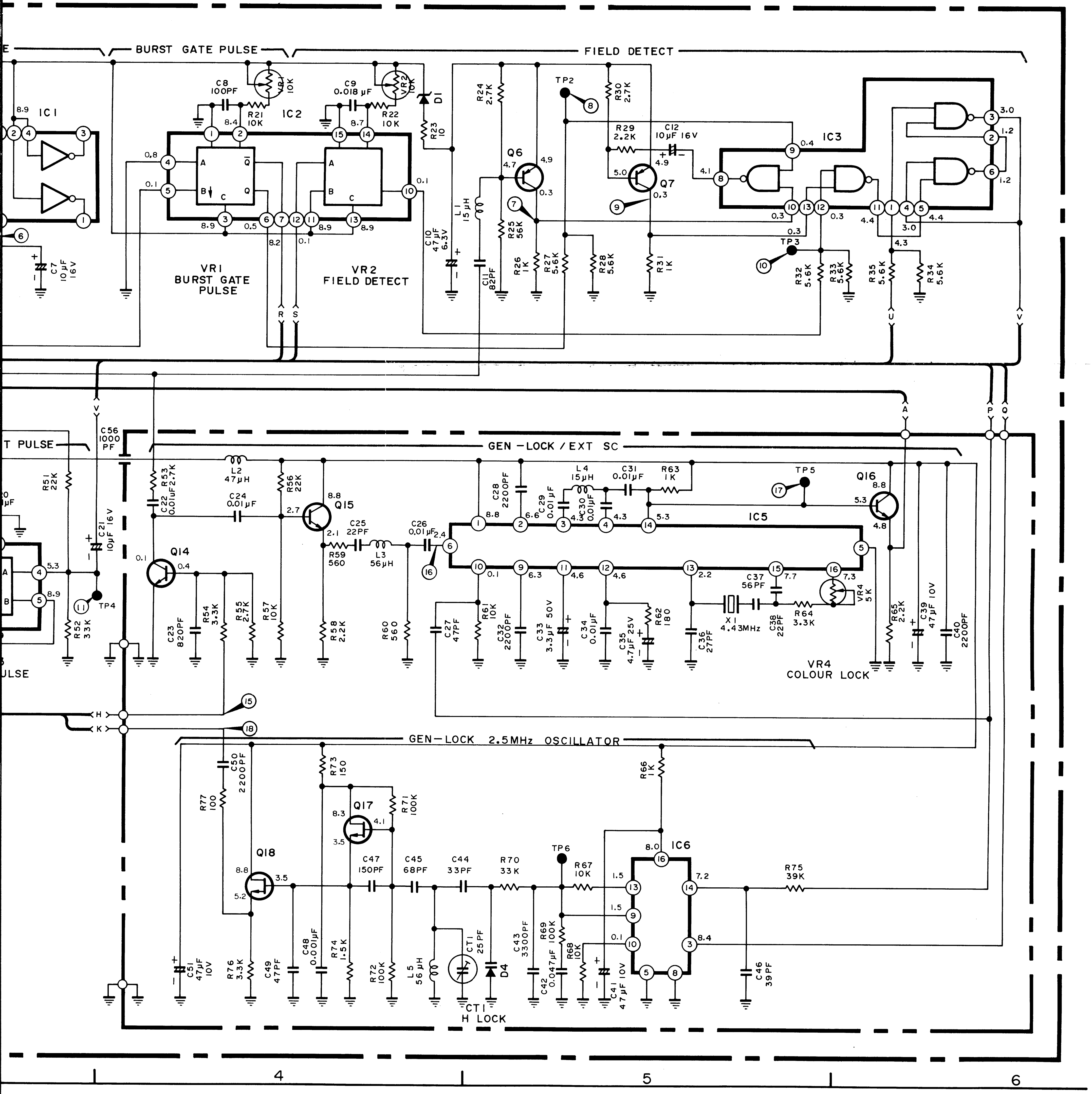
SCHEMATIC DIAGRA



SYNC SEPARATION
GEN-LOCK H PHASE
BURST GATE
GEN-LOCK DETECTION
V. SEPARATION
V RESET PULSE
+9V DC REGULATOR
BATTERY WARNING
CN8
GND 1
EXT SC OUT 2
+12V IN 3
CAMERA/RCU CONT IN 4
5
POWER TRANSISTOR BASE 6
+9.0V COLLECTOR 7
+9.0V CONT IN 8
9
INT/EXT CONT OUT 10
+9.0V IN 11
+9.0V IN 12
H.PHASE CONT IN 13
PAL PULSE IN 14
15
V.RESET OUT 16
EXT 2.5MHz OUT 17
HD IN 18
GEN-LOCK IN 19
Vs IN 20
BATTERY WARNING OUT 21
GND 22
+12V
Q1
Q2
Q3
Q4
Q5
Q8
Q9
Q10
Q11
Q12
Q13
Q19
IC1
IC4
IC7
IC8
IC9
TP1
TP7
TP-E
VR3 V RESET PULSE
VR5 BATTERY WARNING
VR6 +9V ADJ
C
B
A
1
2
3

IC1	HD14572UBP	C3	Q1	2SD636-RS	C2	Q10	2SB641-RS	B2	D1
IC2	YWHD14538BP	C4	Q2	2SB641-RS	C2	Q11	2SB641-RS	B2	D2
IC3	YWHD74LS00P	C5, C6	Q3	2SD636-RS	C2	Q12	2SD636-RS	B2	D3
IC4	YWHD14538BP	B3	Q4	2SD636-RS	C2	Q13	2SB-643-RS	B2	D4
IC5	AN-236	B5	Q5	2SB641-RS	C3	Q14	2SD636-RS	B4	D5
IC6	HD14046BP	A5	Q6	2SB641-RS	C5	Q15	2SD636-RS	B4	
IC7	YWHD14040BP	A3	Q7	2SB641-RS	C5	Q16	2SD636-RS	B6	
IC8	AN6913	A2	Q8	2SC2377-CD	B2	Q17	2SK83-RS	C4	
IC9	HA17723G	A2	Q9	2SC2377-CD	B2	Q18	2SK83-RS	C4	
						Q19	2SB793-QR	A2	

AGRAM OF SYNC-2 BOARD

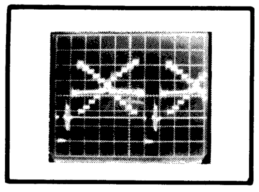


BURST GATE PULSE
FIELD DETECT
IC1
IC2
IC3
IC5
IC6
VR1 BURST GATE PULSE
VR2 FIELD DETECT
VR4 COLOUR LOCK
GEN-LOCK / EXT SC
GEN-LOCK 2.5MHz OSCILLATOR
C8 100PF
C9 0.018µF
VR1 10K
VR2 10K
R21 10K
R22 10K
D1
R23 10
R24 2.7K
R25 56K
R26 1K
R27 5.6K
R28 5.6K
R29 2.2K
R30 2.7K
R31 1K
R32 5.6K
R33 5.6K
R34 5.6K
R35 5.6K
C7 10µF 16V
C10 47µF 6.3V
C11 82PF
C12 10µF 16V
L1 15µH
Q6
Q7
TP2
TP3
TP4
TP5
TP6
C56 1000 PF
R51 22K
R52 33K
R53 2.7K
C21 10µF 16V
C22 0.01µF
C23 820PF
C24 0.01µF
C25 22PF
C26 0.01µF
L2 47µH
L3 56µH
R54 3.3K
R55 2.7K
R56 22K
R57 10K
R58 2.2K
R59 560
R60 560
Q14
Q15
Q16
C27 47PF
C28 2200PF
C29 0.01µF
C30 0.01µF
C31 0.01µF
C32 2200PF
C33 3.3µF 50V
C34 0.01µF
C35 4.7µF 25V
C36 27PF
C37 56PF
C38 22PF
C39 47µF 10V
C40 2200PF
L4 15µH
R61 10K
R62 180
R63 1K
R64 3.3K
R65 2.2K
X1 4.43MHz
VR4 5K
Q17
Q18
C41 47µF 10V
C42 0.047µF
C43 3300PF
C44 33PF
C45 68PF
C46 39PF
C47 150PF
C48 0.001µF
C49 47PF
C50 2200PF
C51 47µF 10V
CT1 25PF
CT1 H LOCK
D4
L5 56µH
R66 1K
R67 10K
R68 10K
R69 100K
R70 33K
R71 100K
R72 100K
R73 150
R74 1.5K
R75 39K
R76 3.3K
R77 100
T PULSE
LSE
A
B
H
K
P
Q
R
S
U
V
4
5
6

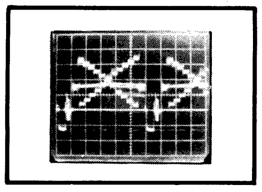
D1	XZ045	C4
D2	MA165	B2
D3	MA165	B2
D4	1S2687	A5
D5	XZ053	A2

SIGNAL WAVEFORMS OF SYNC-2 BOARD

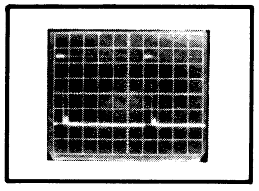
1 0.2V/DIV, 10μs/DIV



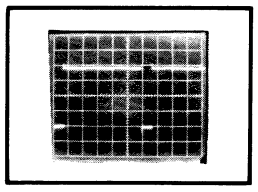
2 0.2V/DIV, 10μs/DIV



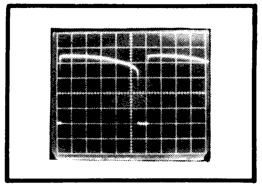
3 2V/DIV, 10μs/DIV



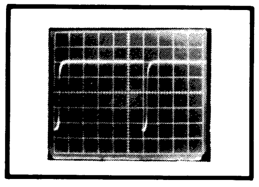
4 2V/DIV, 10μs/DIV



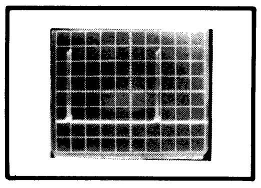
5 2V/DIV, 10μs/DIV



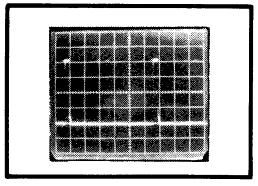
6 2V/DIV, 10μs/DIV



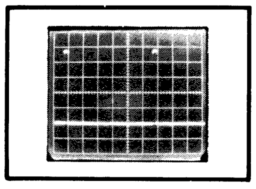
7 1V/DIV, 10μs/DIV



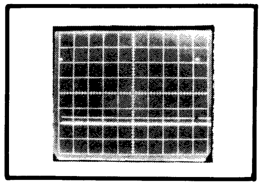
8 1V/DIV, 10μs/DIV



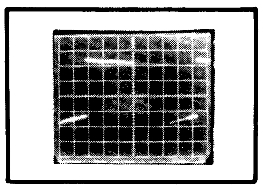
9 1V/DIV, 10μs/DIV



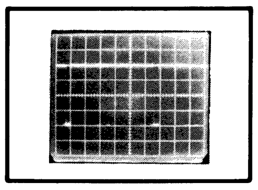
10 1V/DIV, 2ms/DIV



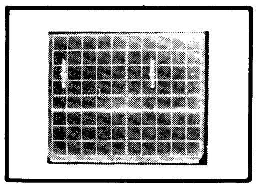
11 1V/DIV, 10ms/DIV



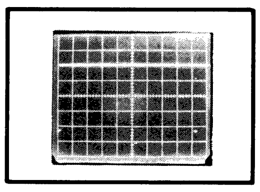
12 2V/DIV, 10μs/DIV



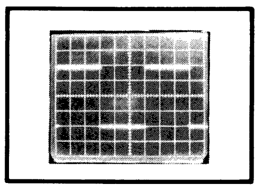
13 1V/DIV, 10μs/DIV



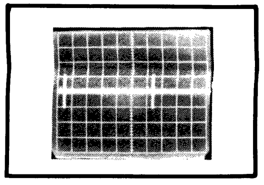
14 2V/DIV, 2ms/DIV



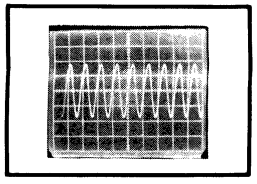
15 2V/DIV, 20μs/DIV



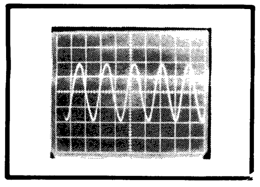
16 0.2V/DIV, 20μs/DIV



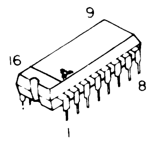
17 0.5V/DIV, 0.2μs/DIV



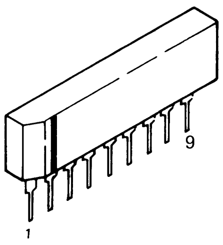
18 1V/DIV, 0.2μs/DIV



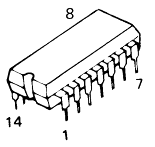
AN236



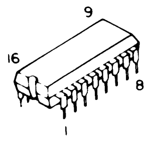
AN6913



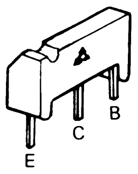
YWHD74LS00P
HA17723G



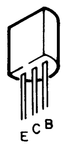
HD14046BP
HD14572UBP
YWHD14040BP
YWHD14538BP



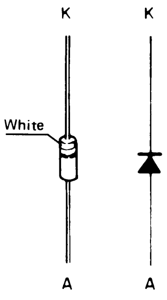
2SB643-RS
2SC2377-CD
2SB641-RS
2SB793-QR
2SD636-RS



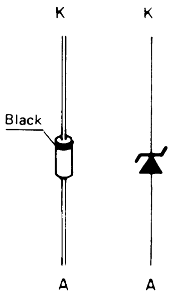
2SK83-RS



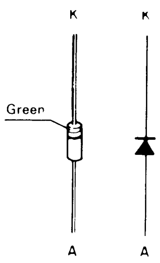
MA165



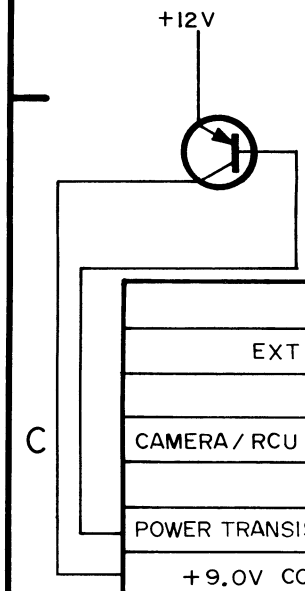
XZ045
XZ053



1S2687

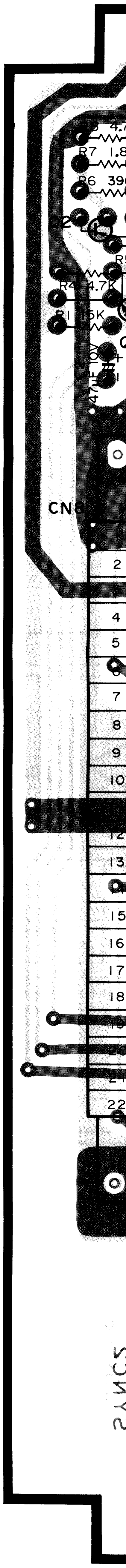


CONDU

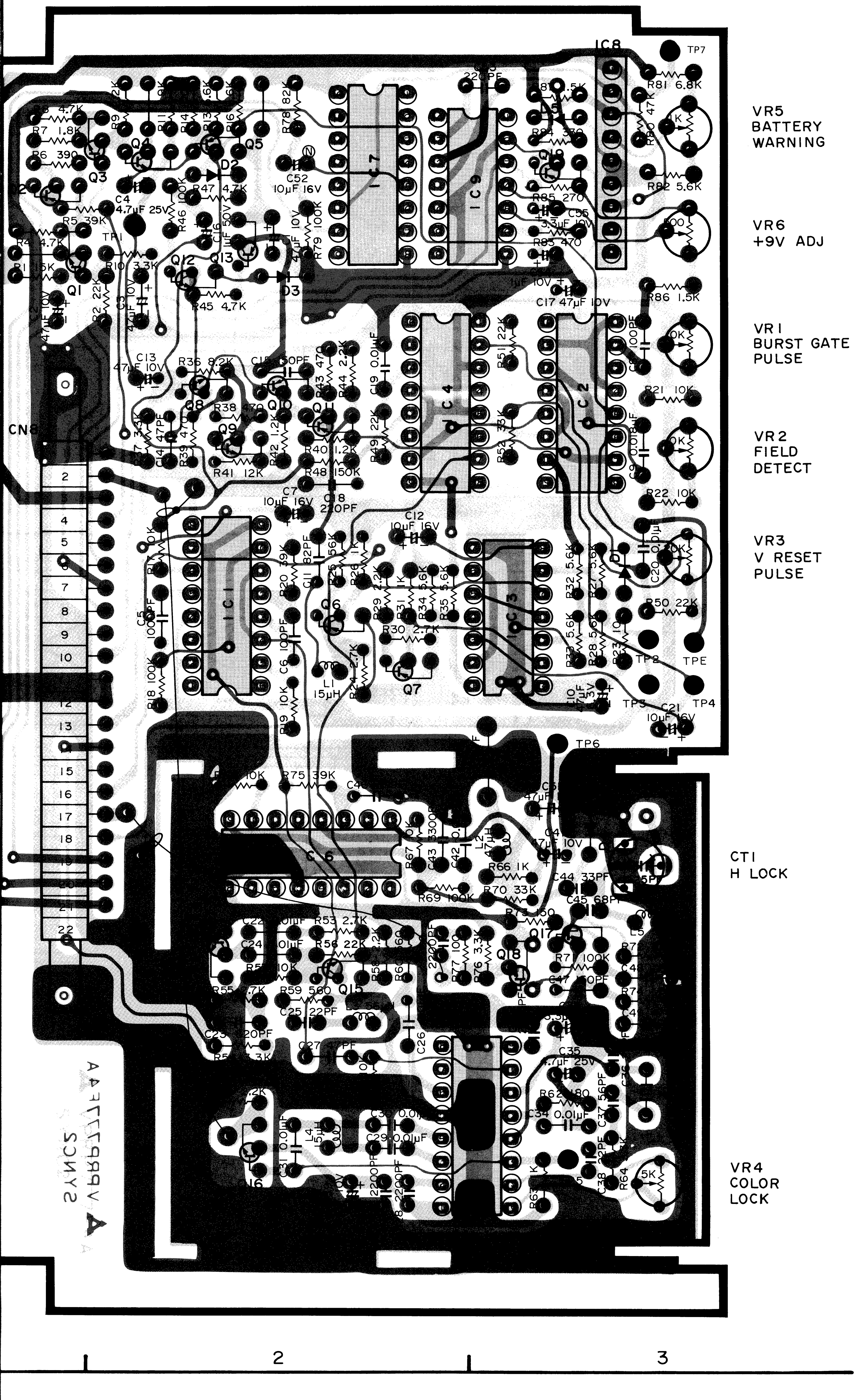


CN8

GND	1
EXT SC OUT	2
+12V IN	3
CAMERA/RCU CONT IN	4
	5
POWER TRANSISTOR BASE	6
+9.0V COLLECTOR	7
+9.0V CONT IN	8
	9
INT/EXT CONT OUT	10
+9.0V IN	11
+9.0V IN	12
H. PHASE CONT IN	13
PAL PULSE IN	14
	15
V. RESET OUT	16
EXT 2.5MHz OUT	17
HD IN	18
GEN-LOCK IN	19
Vs IN	20
BATTERY WARNING OUT	21
GND	22

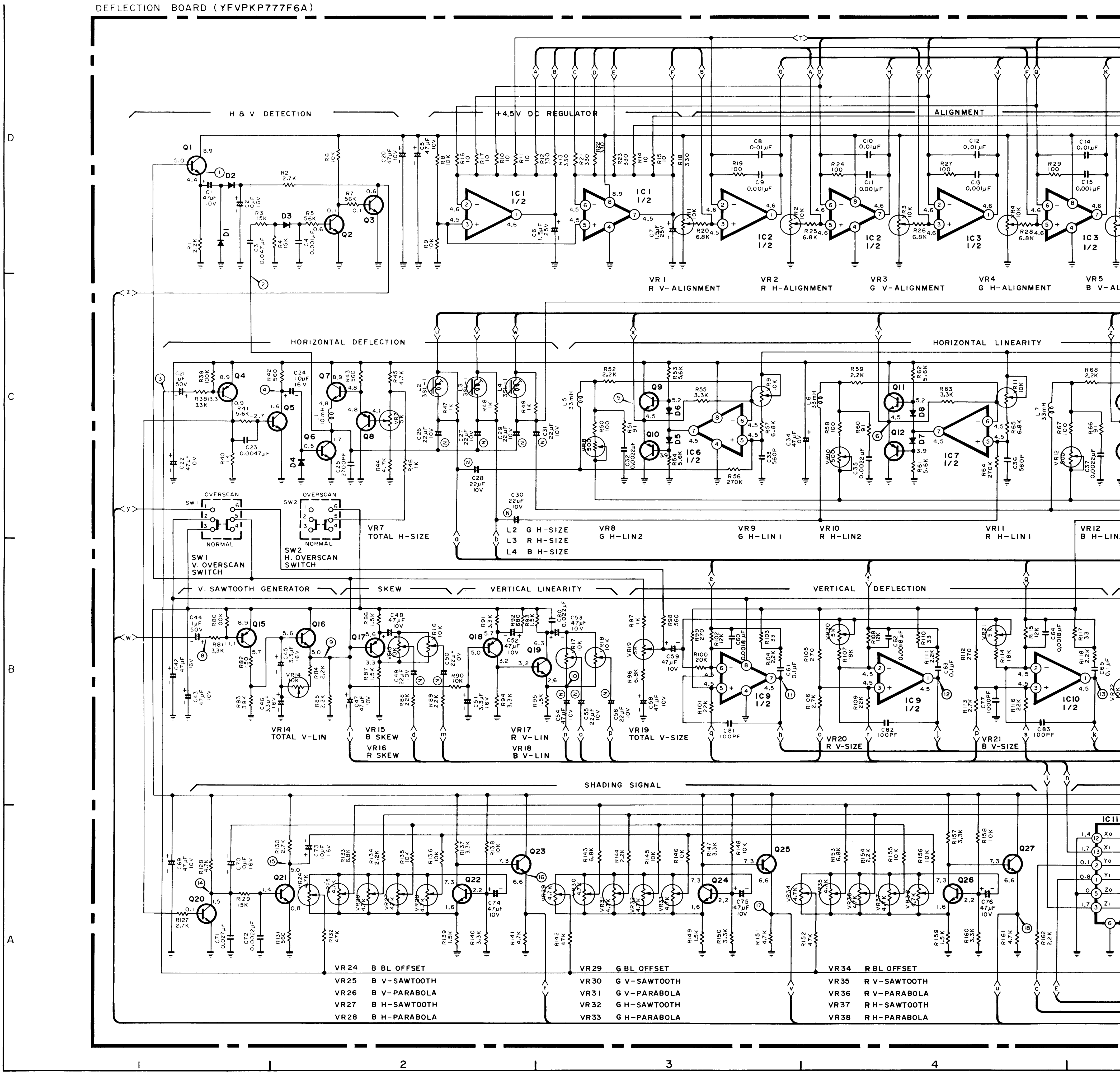

R7 1.8
R6 39
R4 4.7K
R1 15K
CN8

CONDUCTOR VIEW OF SYNC-2 BOARD


IC1
IC2
IC3
IC4
IC6
IC7
IC8
IC9
TP1
TP2
TP3
TP4
TP6
TP7
TPE
CN8
Q1
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q12
Q13
Q15
Q16
Q17
Q18
VR5
BATTERY
WARNING
VR6
+9V ADJ
VR1
BURST GATE
PULSE
VR2
FIELD
DETECT
VR3
V RESET
PULSE
CT1
H LOCK
VR4
COLOR
LOCK
SYNC2
VPRP7717A
2
3

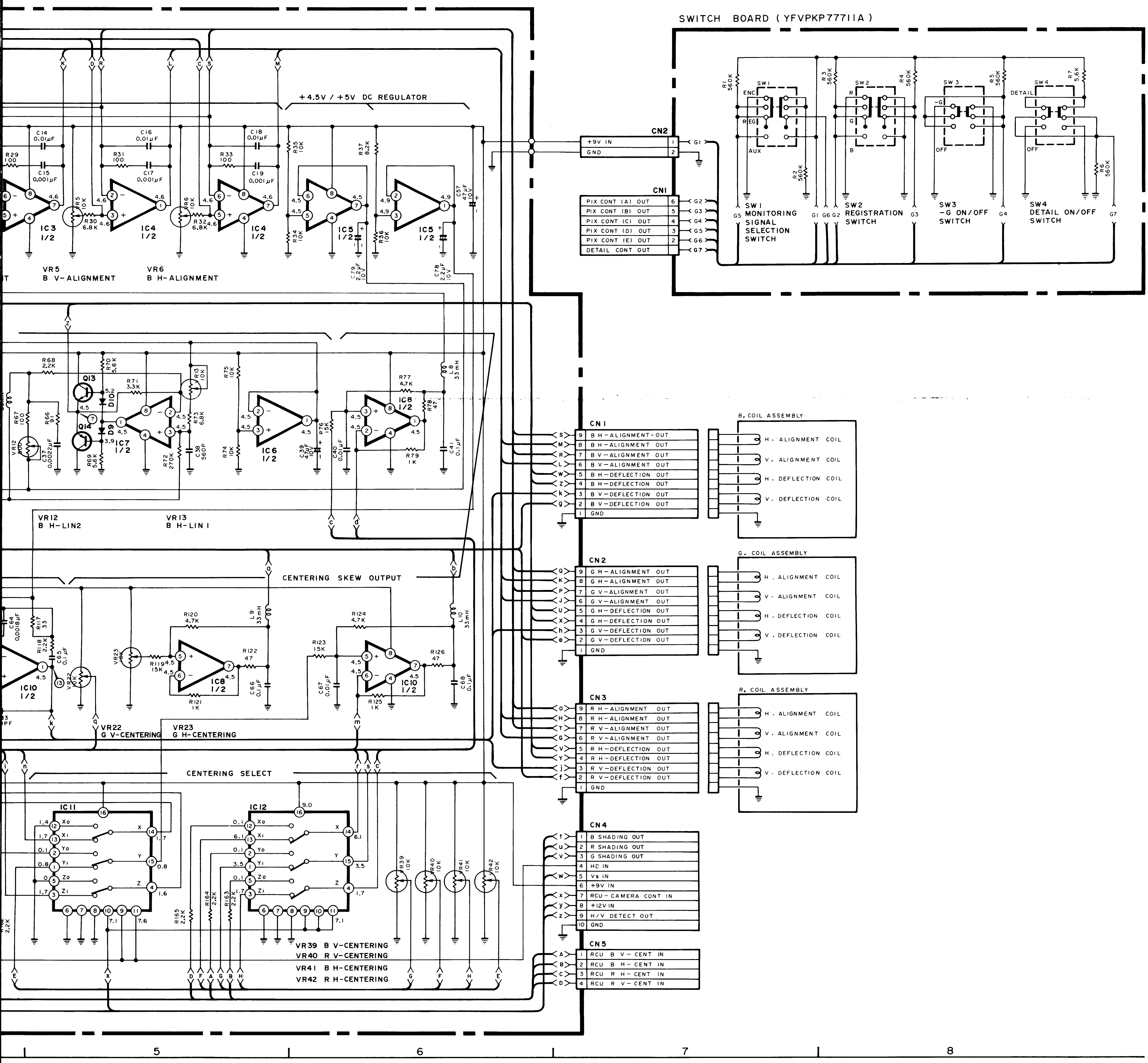
IC1	HD14572UBP	C2
IC2	YWHD14538BP	C3, D3
IC3	YWHD74LS00P	C3
IC4	YWHD14538BP	C2, C3, D2, D3
IC5	AN-236	A2, A3
IC6	HD14046BP	B2
IC7	YWHD14040BP	D7
IC8	AN6913	D3
IC9	HA17723G	D2, D3
Q1	2SD636-RS	D1, D2
Q2	2SB641-RS	D1
Q3	2SD636-RS	D1, D2
Q4	2SD636-RS	D2
Q5	2SB641-RS	D2
Q6	2SB641-RS	C2
Q7	2SB641-RS	C2
Q8	2SC2377-CD	C2
Q9	2SC2377-CD	C2
Q10	2SB641-RS	C2
Q11	2SB641-RS	C2
Q12	2SD636-RS	D2
Q13	2SB-643-RS	D2
Q14	2SD636-RS	B2
Q15	2SD636-RS	B2
Q16	2SD636-RS	A2
Q17	2SK83-RS	B3
Q18	2SK83-RS	B3
Q19	2SB793-QR	D3
D1	XZ045	C3
D2	MA165	D2
D3	MA165	D2
D4	1S2687	B3
D5	XZ053	D3

SCHEMATIC DIAGRAM


DEFLECTION BOARD (YFVPKP777F6A)
H & V DETECTION
+4.5V DC REGULATOR
ALIGNMENT
IC1 1/2
IC2 1/2
IC3 1/2
VR1 R V-ALIGNMENT
VR2 R H-ALIGNMENT
VR3 G V-ALIGNMENT
VR4 G H-ALIGNMENT
VR5 B V-AL
HORIZONTAL DEFLECTION
HORIZONTAL LINEARITY
IC6 1/2
IC7 1/2
SW1 V. OVERSCAN SWITCH
SW2 H. OVERSCAN SWITCH
OVERSCAN
NORMAL
VR7 TOTAL H-SIZE
L2 G H-SIZE
L3 R H-SIZE
L4 B H-SIZE
VR8 G H-LIN2
VR9 G H-LIN1
VR10 R H-LIN2
VR11 R H-LIN1
VR12 B H-LIN
V. SAWTOOTH GENERATOR
SKEW
VERTICAL LINEARITY
VERTICAL DEFLECTION
IC9 1/2
IC10 1/2
VR14 TOTAL V-LIN
VR15 B SKEW
VR16 R SKEW
VR17 R V-LIN
VR18 B V-LIN
VR19 TOTAL V-SIZE
VR20 R V-SIZE
VR21 B V-SIZE
SHADING SIGNAL
IC11
VR24 B BL OFFSET
VR25 B V-SAWTOOTH
VR26 B V-PARABOLA
VR27 B H-SAWTOOTH
VR28 B H-PARABOLA
VR29 G BL OFFSET
VR30 G V-SAWTOOTH
VR31 G V-PARABOLA
VR32 G H-SAWTOOTH
VR33 G H-PARABOLA
VR34 R BL OFFSET
VR35 R V-SAWTOOTH
VR36 R V-PARABOLA
VR37 R H-SAWTOOTH
VR38 R H-PARABOLA
D
C
B
A
1
2
3
4

IC 1	NJM4556D	D2, D3	IC8	NJM4556D	C6, B5	Q 1	2SD636-RS	D1	Q8	2SA564-RS	C2	Q15	2SB641-
IC 2	NJM4556D	D3, D4	IC9	NJM4556D	B3, B4	Q 2	2SD636-RS	D2	Q9	2SD636-RS	C3	Q16	2SD636-
IC 3	NJM4556D	D4, D5	IC10	NJM4556D	B4, B5, B6	Q 3	2SD636-RS	D2	Q10	2SB641-RS	C3	Q17	2SB641-
IC 4	NJM4556D	D5	IC11	YWMC14053BCP	A5	Q 4	2SB641-RS	C1	Q11	2SC828-RS	C4	Q18	2SB641-
IC 5	NJM4556D	D6	IC12	YWMC14053BCP	A5, A6	Q 5	2SD638-QR	C2	Q12	2SB641-RS	C4	Q19	2SD636-
IC 6	NJM4556D	C3, C5				Q 6	2SD959-PQ	C2	Q13	2SD636-RS	C5	Q20	2SD636-
IC 7	NJM4556D	C4, C5				Q 7	2SC1567-QR	C2	Q14	2SB641-RS	C5	Q21	2SD636-

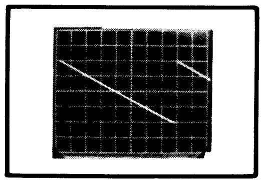
GRAM OF DEFLECTION BOARD


SWITCH BOARD (YFVPKP77711A)
SW1 MONITORING SIGNAL SELECTION SWITCH
SW2 REGISTRATION SWITCH
SW3 -G ON/OFF SWITCH
SW4 DETAIL ON/OFF SWITCH
ENC
REG
AUX
DETAIL
OFF
CN2
+9V IN
GND
CN1
PIX CONT (A) OUT
PIX CONT (B) OUT
PIX CONT (C) OUT
PIX CONT (D) OUT
PIX CONT (E) OUT
DETAIL CONT OUT
+4.5V / +5V DC REGULATOR
VR5 B V-ALIGNMENT
VR6 B H-ALIGNMENT
VR12 B H-LIN2
VR13 B H-LIN1
CENTERING SKEW OUTPUT
VR22 G V-CENTERING
VR23 G H-CENTERING
CENTERING SELECT
IC11
IC12
VR39 B V-CENTERING
VR40 R V-CENTERING
VR41 B H-CENTERING
VR42 R H-CENTERING
CN1
B H-ALIGNMENT OUT
B H-ALIGNMENT OUT
B V-ALIGNMENT OUT
B V-ALIGNMENT OUT
B H-DEFLECTION OUT
B H-DEFLECTION OUT
B V-DEFLECTION OUT
B V-DEFLECTION OUT
GND
B. COIL ASSEMBLY
CN2
G H-ALIGNMENT OUT
G H-ALIGNMENT OUT
G V-ALIGNMENT OUT
G V-ALIGNMENT OUT
G H-DEFLECTION OUT
G H-DEFLECTION OUT
G V-DEFLECTION OUT
G V-DEFLECTION OUT
GND
G. COIL ASSEMBLY
CN3
R H-ALIGNMENT OUT
R H-ALIGNMENT OUT
R V-ALIGNMENT OUT
R V-ALIGNMENT OUT
R H-DEFLECTION OUT
R H-DEFLECTION OUT
R V-DEFLECTION OUT
R V-DEFLECTION OUT
GND
R. COIL ASSEMBLY
H. ALIGNMENT COIL
V. ALIGNMENT COIL
H. DEFLECTION COIL
V. DEFLECTION COIL
CN4
B SHADING OUT
R SHADING OUT
G SHADING OUT
HD IN
Vs IN
+9V IN
RCU-CAMERA CONT IN
+12V IN
H/V DETECT OUT
GND
CN5
RCU B V-CENT IN
RCU B H-CENT IN
RCU R H-CENT IN
RCU R V-CENT IN
5
6
7
8

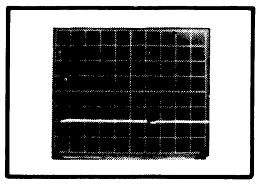
5	2SB641-RS	B1	Q22	2SD636-RS	A2	D1	MA165	D1	D8	MA165	C4
6	2SD636-RS	B2	Q23	2SD636-RS	A2	D2	MA165	D1	D9	MA165	C5
7	2SB641-RS	B2	Q24	2SD636-RS	A3	D3	MA165	D2	D10	MA165	C5
8	2SB641-RS	B2	Q25	2SD636-RS	A3	D4	MA165	C2			
9	2SD636-RS	B2, B3	Q26	2SD636-RS	A4	D5	MA165	C3			
0	2SD636-RS	A1	Q27	2SD636-RS	A4	D6	MA165	C3			
1	2SD636-RS	A2				D7	MA165	C4			

SIGNAL WAVEFORMS OF DEFLECTION BOARD

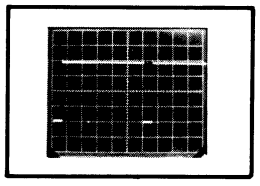
1 0.5V/DIV, 2ms/DIV



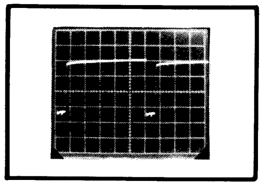
2 20V/DIV, 10μs/DIV



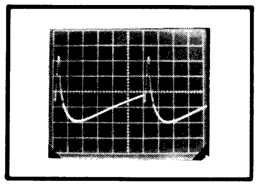
3 2V/DIV, 10μs/DIV



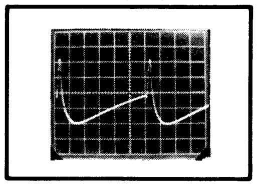
4 0.5V/DIV, 10μs/DIV



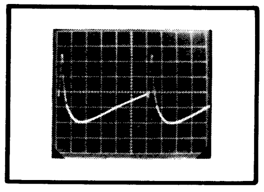
5 0.5V/DIV, 10μs/DIV



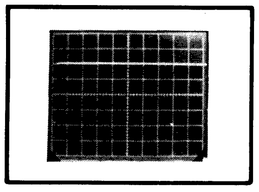
6 0.5V/DIV, 10μs/DIV



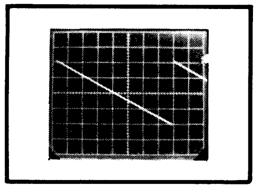
7 0.5V/DIV, 10μs/DIV



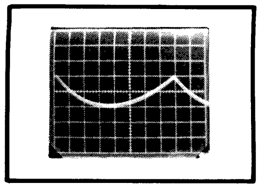
8 2V/DIV, 2ms/DIV



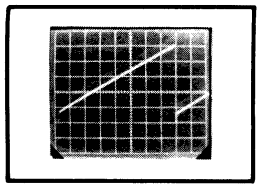
9 0.5V/DIV, 2ms/DIV



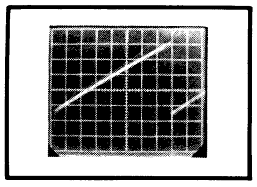
10 0.5V/DIV, 2ms/DIV



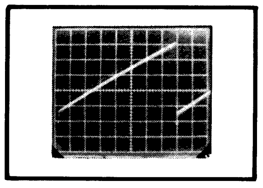
11 1V/DIV, 2ms/DIV



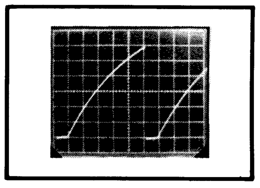
12 1V/DIV, 2ms/DIV



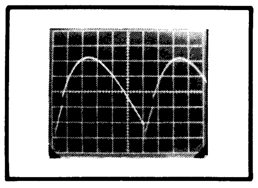
13 1V/DIV, 2ms/DIV



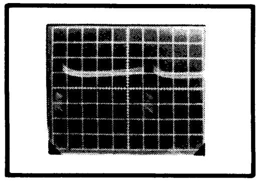
14 0.5V/DIV, 10μs/DIV



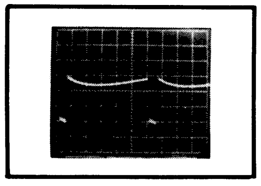
15 0.5V/DIV, 10μs/DIV



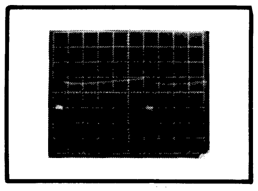
16 0.02V/DIV, 10μs/DIV



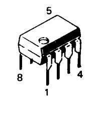
17 0.1V/DIV, 10μs/DIV



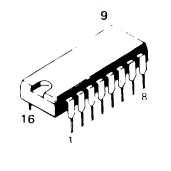
18 0.1V/DIV, 10μs/DIV



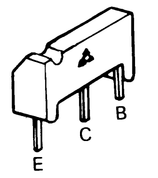
NJM4556D



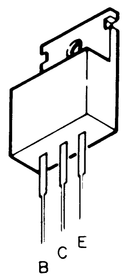
YWMC14053BCP



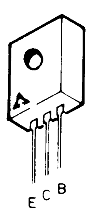
2SD636-RS
2SB641-RS
2SD638-QR
2SA564-RS



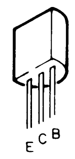
2SD959-PQ



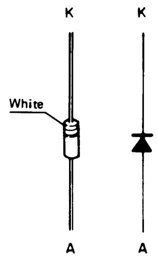
2SC1567-QR



2SC828-RS



MA165



CONDUCTOR

VR23
G H-CENTERING

VR7
TOTAL H-SIZE

L2
G H-SIZE

VR9
G H-LIN I

VRII
R H-LIN I

VRI3
B H-LIN I

VR8
G H-LIN2

VR6
B H-ALIGNMENT

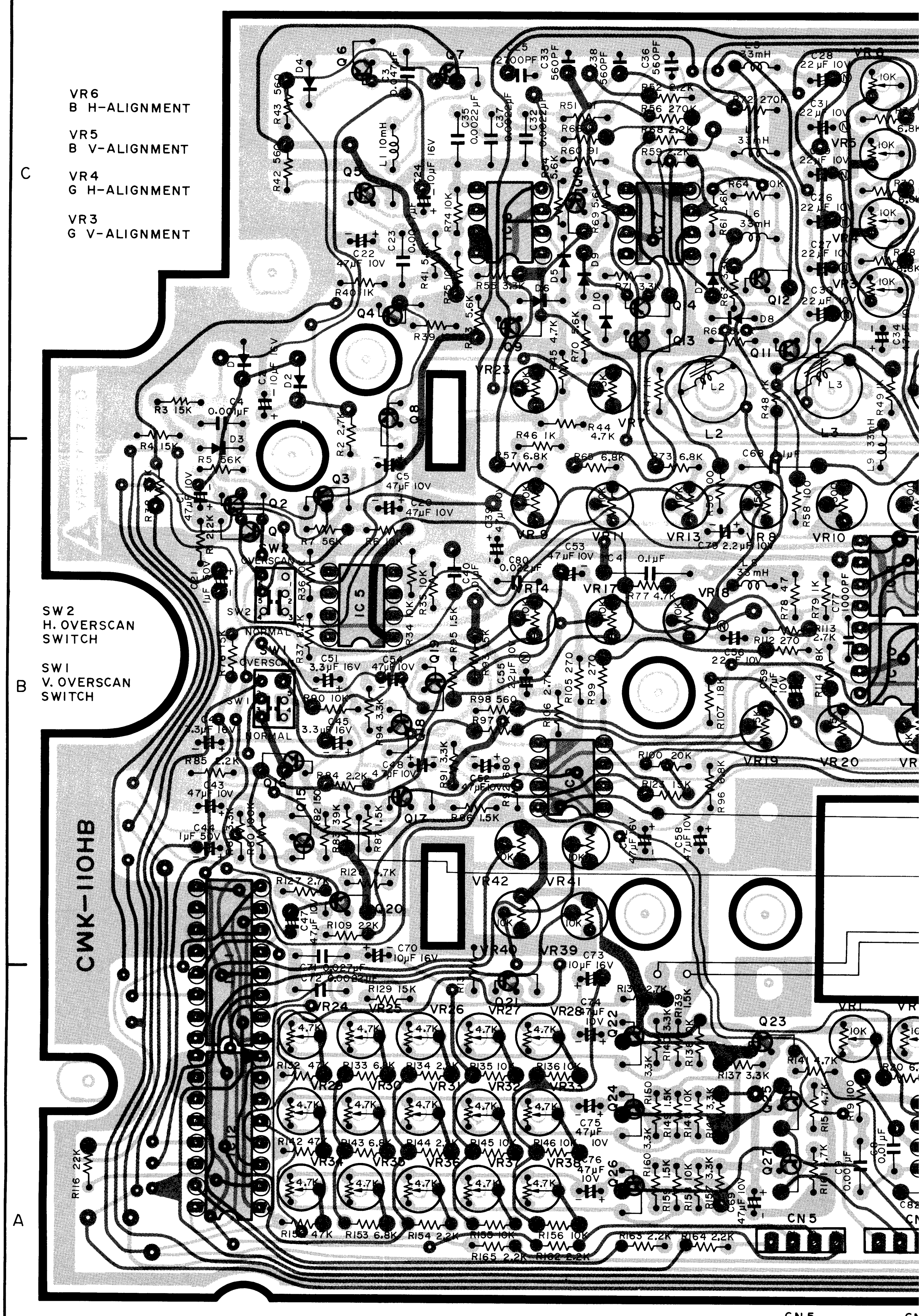
VR5
B V-ALIGNMENT

VR4
G H-ALIGNMENT

VR3
G V-ALIGNMENT

SW2
H. OVERSCAN
SWITCH

SWI
V. OVERSCAN
SWITCH



VR24 B BL OFFSET	VR25 B V-SAWTOOTH	VR26 B V-PARABOLA	VR27 B H-SAWTOOTH	VR28 B H-PARABOLA
VR29 G BL OFFSET	VR30 G V-SAWTOOTH	VR31 G V-PARABOLA	VR32 G H-SAWTOOTH	VR33 G H-PARABOLA
VR34 R BL OFFSET	VR35 R V-SAWTOOTH	VR36 R V-PARABOLA	VR37 R H-SAWTOOTH	VR38 R H-PARABORA

CN5

1	2	3	4
RCU B V-CENT IN	RCU B H-CENT IN	RCU R H-CENT IN	RCU R V-CENT IN

1	2	3
B SHADING OUT	R SHADING OUT	G SHADING OUT

IC1	NJM4556D	B3	IC9	NJM4556D	B2	Q4	2SB641-RS	C1	Q12
IC2	NJM4556D	A2, A3	IC10	NJM4556D	B2	Q5	2SD638-QR	C1	Q13
IC3	NJM4556D	C3	IC11	YWMC14053BCP	A1, B1	Q6	2SD959-PQ	C1	Q14
IC4	NJM4556D	C3	IC12	YWMC14053BCP	A1	Q7	2SC1567-QR	C1	Q15
IC5	NJM4556D	B1				Q8	2SA564-RS	C1	Q16
IC6	NJM4556D	C1, C2	Q1	2SD636-RS	B1	Q9	2SD636-RS	C2	Q17
IC7	NJM4556D	C2	Q2	2SD636-RS	B1	Q10	2SB641-RS	C2	Q18
IC8	NJM4556D	B2	Q3	2SD636-RS	B1	Q11	2SC828-RS	C2	Q19

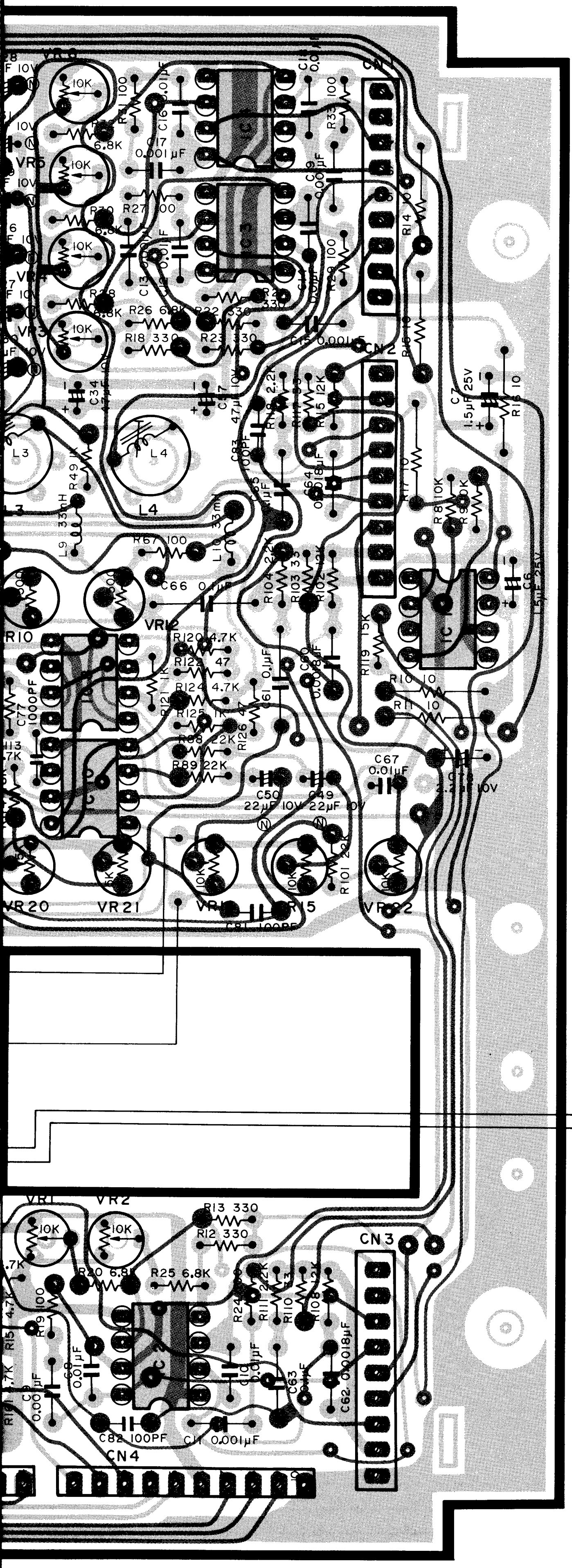
CTOR VIEW OF DEFLECTION BOARD

L3
R H-SIZE

L4
B H-SIZE

VR10
R H-LIN2

VR12
B H-LIN2



VR6
10K
VR5
10K
VR4
10K
VR3
10K
IC1
IC3
IC2
IC4
CN1
CN2
CN3
CN4
L3
L4
VR10
VR12
VR20
VR21
VR22
VR15
VR16
VR1
VR2
R13 330
R12 330
R25 6.8K
C82 100PF
C11 0.001μF
C62 0.0018μF
C67 0.01μF
C7 1.5μF 25V
C6 1.5μF 25V
C81 100PF
C50 22μF 10V
C49 22μF 10V
R67 100
C66 0.1μF
R18 330
R26 6.8K
R22 330
R23 330
R27 100
C17 0.001μF
R14 10
R16 10
R17 10
R10 10
R11 10
R119 15K
R120 4.7K
R124 4.7K
R88 22K
R89 22K

CN1

9	B H-ALIGNMENT OUT
8	B H-ALIGNMENT OUT
7	B V-ALIGNMENT OUT
6	B V-ALIGNMENT OUT
5	B H-DEFLECTION OUT
4	B H-DEFLECTION OUT
3	B V-DEFLECTION OUT
2	B V-DEFLECTION OUT
1	GND

CN2

9	G H-ALIGNMENT OUT
8	G H-ALIGNMENT OUT
7	G V-ALIGNMENT OUT
6	G V-ALIGNMENT OUT
5	G H-DEFLECTION OUT
4	G H-DEFLECTION OUT
3	G V-DEFLECTION OUT
2	G V-DEFLECTION OUT
1	GND

VR14
TOTAL V-LIN

VR17
R V-LIN

VR18
B V-LIN

VR19
TOTAL V-SIZE

VR20
R V-SIZE

VR21
B V-SIZE

VR16
R SKEW

VR15
B SKEW

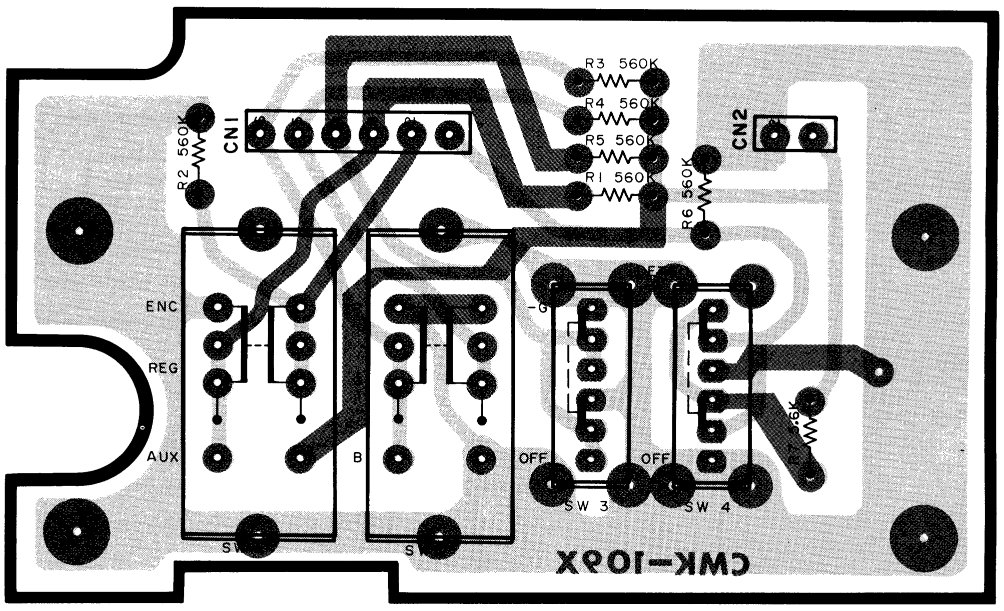
VR22
G V-CENTERING

CN1

6	PIX CONT(A) OUT
5	PIX CONT(B) OUT
4	PIX CONT(C) OUT
3	PIX CONT(D) OUT
2	PIX CONT(E) OUT
1	DETAIL CONT OUT

CN2

2	GND
1	+9V IN



R3 560K
R4 560K
R5 560K
R1 560K
R2 560K
R6 560K
R7 5.6K
CN1
CN2
ENC
REG
AUX
B
-G
OFF
OFF
SW 3
SW 4
SW
SW
CWK-109X

SW1
MONITORING SIGNAL
SELECTION SWITCH

SW2
REGISTRATION
SWITCH

SW3
-G ON/OFF
SWITCH

SW4
DETAIL ON/OFF
SWITCH

CN3

9	R H-ALIGNMENT OUT
8	R H-ALIGNMENT OUT
7	R V-ALIGNMENT OUT
6	R V-ALIGNMENT OUT
5	R H-DEFLECTION OUT
4	R H-DEFLECTION OUT
3	R V-DEFLECTION OUT
2	R V-DEFLECTION OUT
1	GND

4	RCU R V-CENT IN

CN 4

1	B SHADING OUT
2	R SHADING OUT
3	G SHADING OUT
4	HD IN
5	Vs IN
6	+9V IN
7	RCU-CAMERA CONT IN
8	+12V IN
9	H/V DETECT OUT
10	GND

VR42
R H-CENTERING

VR41
B H-CENTERING

VR40
R V-CENTERING

VR39
B V-CENTERING

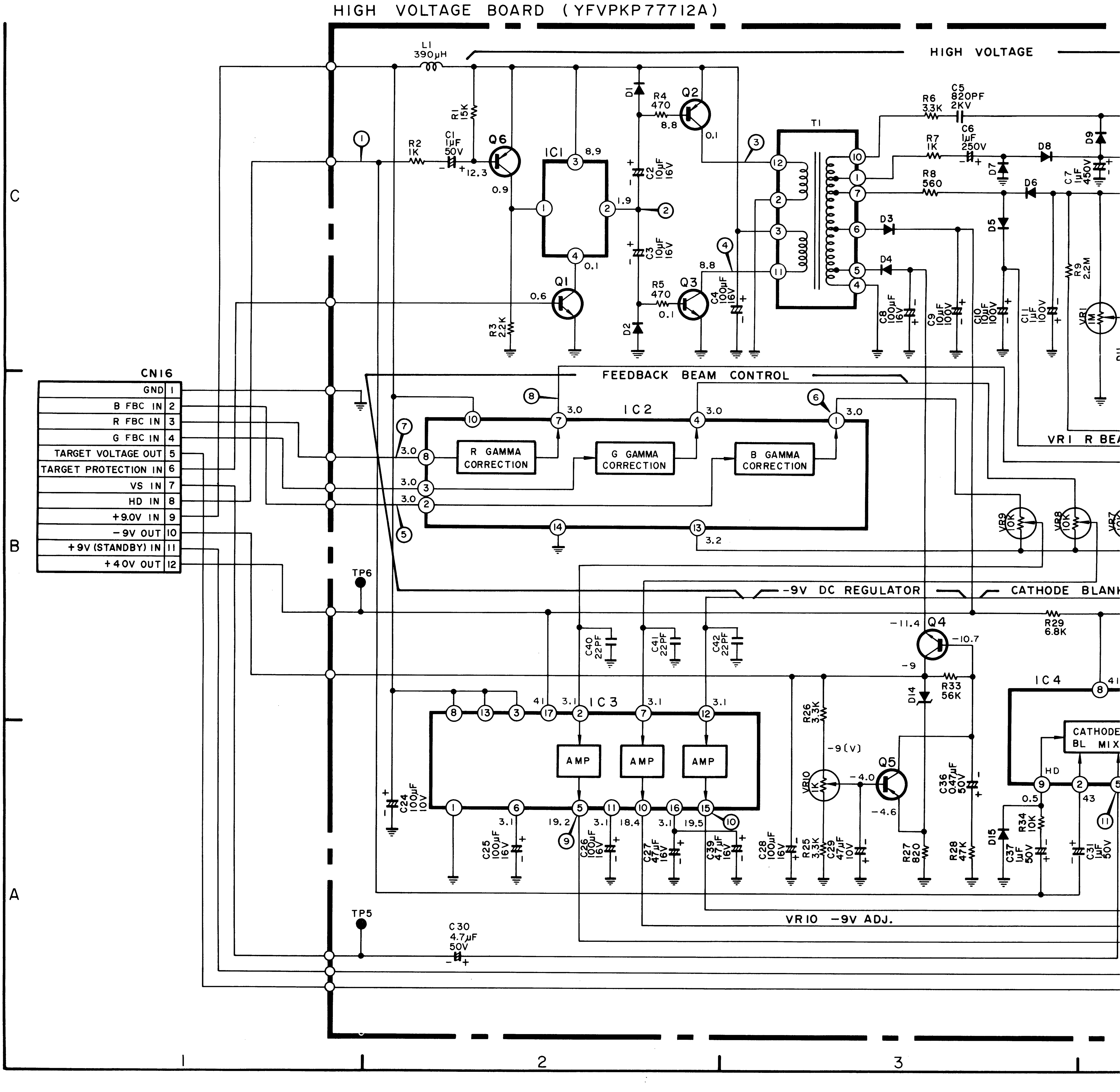
VR1
R V-ALIGNMENT

VR2
R H-ALIGNMENT

3

Q12	2SB641-RS	C2	Q20	2SD636-RS	B1	D1	MA165	C1
Q13	2SD636-RS	C2	Q21	2SD636-RS	A2	D2	MA165	C1
Q14	2SB641-RS	C2	Q22	2SD636-RS	A2	D3	MA165	B1, C1
Q15	2SB641-RS	B1	Q23	2SD636-RS	A2	D4	MA165	C1
Q16	2SD636-RS	B1	Q24	2SD636-RS	A2	D5	MA165	C2
Q17	2SB641-RS	B1	Q25	2SD636-RS	A2	D6	MA165	C2
Q18	2SB641-RS	B1	Q26	2SD636-RS	A2	D7	MA165	C2
Q19	2SD636-RS	B1	Q27	2SD636-RS	A2	D8	MA165	C2
						D9	MA165	C2
						D10	MA165	C2

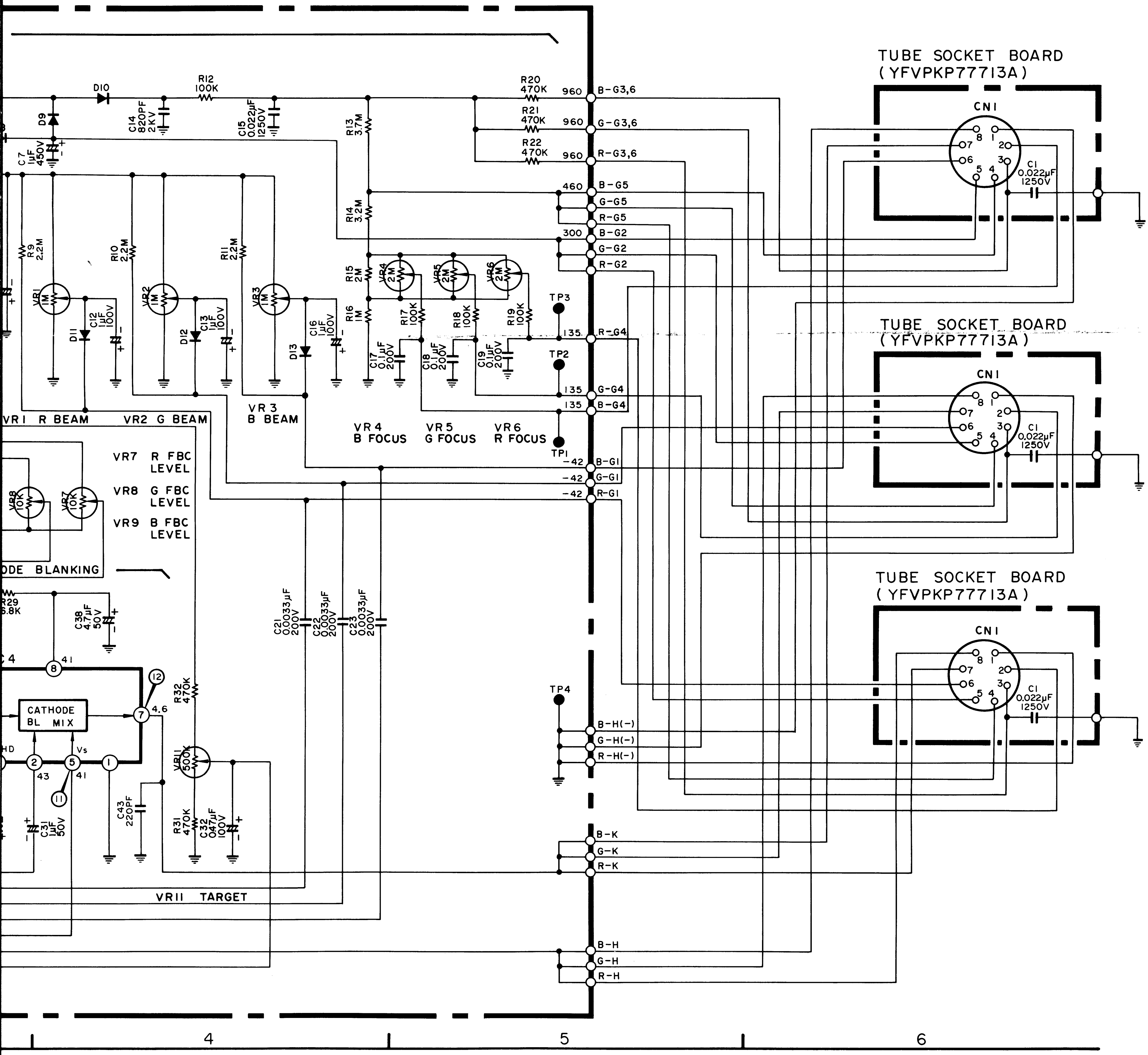
SCHEMATIC DIAGRAM C



HIGH VOLTAGE BOARD (YFVPKP77712A)
HIGH VOLTAGE
FEEDBACK BEAM CONTROL
-9V DC REGULATOR
CATHODE BLANK
VR1 R BEA
VR10 -9V ADJ.
CN16
GND 1
B FBC IN 2
R FBC IN 3
G FBC IN 4
TARGET VOLTAGE OUT 5
TARGET PROTECTION IN 6
VS IN 7
HD IN 8
+9.0V IN 9
-9V OUT 10
+9V (STANDBY) IN 11
+40V OUT 12
L1 390μH
R1 15K
R2 1K
C1 1μF 50V
Q6
IC1
Q1
R3 2.2K
D1
D2
R4 470
R5 470
Q2
Q3
C2 10μF 16V
C3 10μF 16V
C4 100μF 16V
T1
R6 3.3K
C5 820PF 2KV
R7 1K
C6 1μF 250V
R8 560
D3
D4
D5
D6
D7
D8
D9
C7 1μF 450V
C8 100μF 16V
C9 10μF 100V
C10 10μF 100V
C11 1μF 100V
R9 2.2M
VR1 1M
IC2
R GAMMA CORRECTION
G GAMMA CORRECTION
B GAMMA CORRECTION
VR9 10K
VR8 10K
VR7
TP6
TP5
Q4
R29 6.8K
R33 56K
D14
R26 3.3K
VR10 1K
Q5
C36 0.47μF 50V
R25 3.3K
C29 47μF 10V
R27 820
R28 47K
IC4
CATHODE BL MIX
HD
D15
C37 1μF 50V
R34 10K
C31 1μF 50V
C40 22PF
C41 22PF
C42 22PF
IC3
AMP
AMP
AMP
C24 100μF 10V
C25 100μF 16V
C26 10μF 16V
C27 47μF 16V
C39 47μF 16V
C28 100μF 16V
C30 4.7μF 50V
12.3
0.9
8.9
1.9
0.1
0.6
8.8
8.8
0.1
0.1
3.0
3.0
3.0
3.0
3.0
3.0
3.2
-11.4
-10.7
-9
-9 (V)
-4.0
-4.6
41
3.1
3.1
3.1
3.1
19.2
3.1
18.4
3.1
19.5
43
0.5
41
C
B
A
1
2
3

IC1	DN819	C2	Q1	2SB641-RS	C2	D1	MA150	C2	D7	YUDSIR60	C3
IC2	EHMS727S40S	B2	Q2	2SA684-RS	C2	D2	MA150	C2	D8	YUDSIR60	C3
IC3	EHMSU27W71S	A2	Q3	2SC1384-RS	C2	D3	YUDERB12-02	C3	D9	YUDSIR150	C4
IC4	EHMSJ13W72	A3, A4	Q4	2SD636-RS	B3	D4	YUDERB12-02	C3	D10	YUDSIR150	C4
			Q5	2SB641-RS	A3	D5	YUDERB12-02	C3	D11	MA162	C4
			Q6	2SD636-RS	C2	D6	YUDERB12-02	C3	D12	MA162	C4

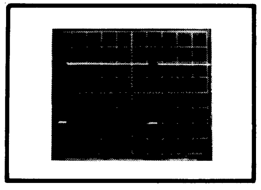
AM OF HIGH VOLTAGE BOARD


D10
R12 100K
D9
C14 820PF 2KV
C15 0.022μF 1250V
C7 1μF 450V
R20 470K
R21 470K
R22 470K
960
960
960
B-G3,6
G-G3,6
R-G3,6
R13 3.7M
R14 3.2M
460
B-G5
G-G5
R-G5
300
B-G2
G-G2
R-G2
R9 2.2M
R10 2.2M
R11 2.2M
VR1 1M
VR2 1M
VR3 1M
C12 1μF 100V
C13 1μF 100V
C16 1μF 100V
D11
D12
D13
R15 2M
R16 1M
VR4 2M
VR5 2M
VR6 2M
R17 100K
R18 100K
R19 100K
C17 0.1μF 200V
C18 0.1μF 200V
C19 0.1μF 200V
TP3
TP2
TP1
135
R-G4
135
G-G4
135
B-G4
VR1 R BEAM
VR2 G BEAM
VR 3 B BEAM
VR4 B FOCUS
VR5 G FOCUS
VR6 R FOCUS
-42
B-G1
-42
G-G1
-42
R-G1
VR7 R FBC LEVEL
VR8 G FBC LEVEL
VR9 B FBC LEVEL
VR8 10K
VR7 10K
ODE BLANKING
R29 6.8K
C38 4.7μF 50V
C21 0.0033μF 200V
C22 0.0033μF 200V
C23 0.0033μF 200V
C 4
8
41
12
R32 470K
CATHODE BL MIX
7
4.6
HD
2
43
5
Vs
41
1
11
C31 1μF 50V
C43 220PF
VR11 500K
R31 470K
C32 0.47μF 100V
VR11 TARGET
TP4
B-H(-)
G-H(-)
R-H(-)
B-K
G-K
R-K
B-H
G-H
R-H
TUBE SOCKET BOARD (YFVPKP77713A)
CN1
8
1
7
2
6
3
5
4
C1 0.022μF 1250V
TUBE SOCKET BOARD (YFVPKP77713A)
CN1
C1 0.022μF 1250V
TUBE SOCKET BOARD (YFVPKP77713A)
CN1
C1 0.022μF 1250V
4
5
6

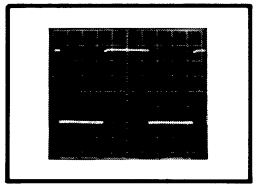
C3	D13	MA162	C4
C3	D14	YUD-XZ051	B3
C4	D15	MA150	A3
C4			
C4			
C4			

SIGNAL WAVEFORMS OF HIGH VOLTAGE BOARD

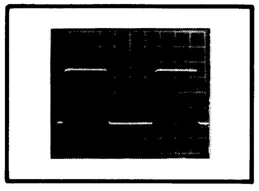
1 2V/DIV, 10μs/DIV



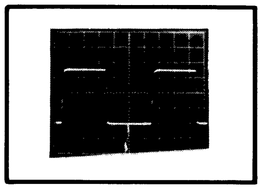
2 0.5V/DIV, 20μs/DIV



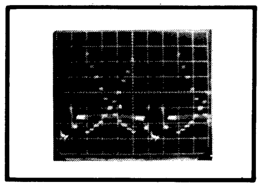
3 5V/DIV, 20μs/DIV



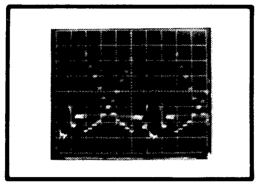
4 5V/DIV, 20μs/DIV



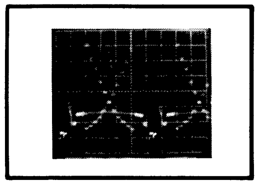
5 0.05V/DIV, 10μs/DIV



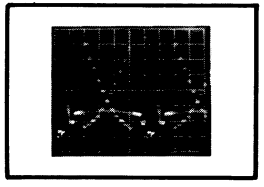
6 0.05V/DIV, 10μs/DIV



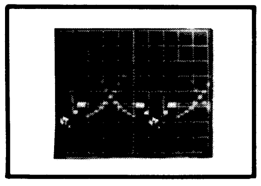
7 0.05V/DIV, 10μs/DIV



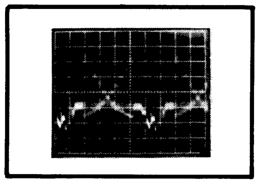
8 0.05V/DIV, 10μs/DIV



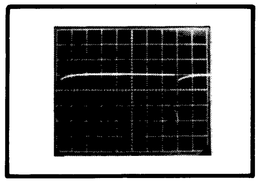
9 0.5V/DIV, 10μs/DIV



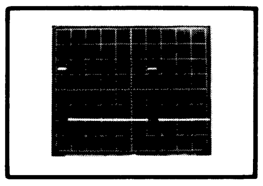
10 0.5V/DIV, 10μs/DIV



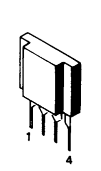
11 0.5V/DIV, 2ms/DIV



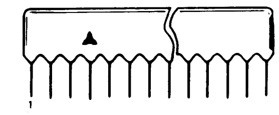
12 10V/DIV, 10μs/DIV



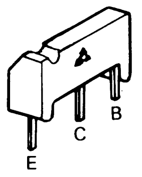
DN819



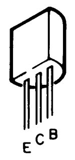
EHMSJ13W72
EMHS727S40S
EHMSU27W71S



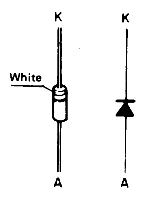
2SB641-RS
2SD636-RS



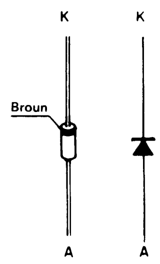
2SA684-RS
2SC1384-RS



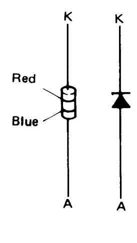
MA150



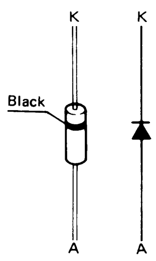
YUDERB12-02



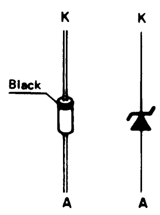
YUDSIR60


K
K
Red
Blue
A
A

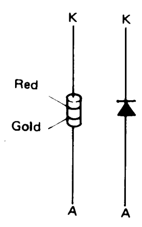
MA162



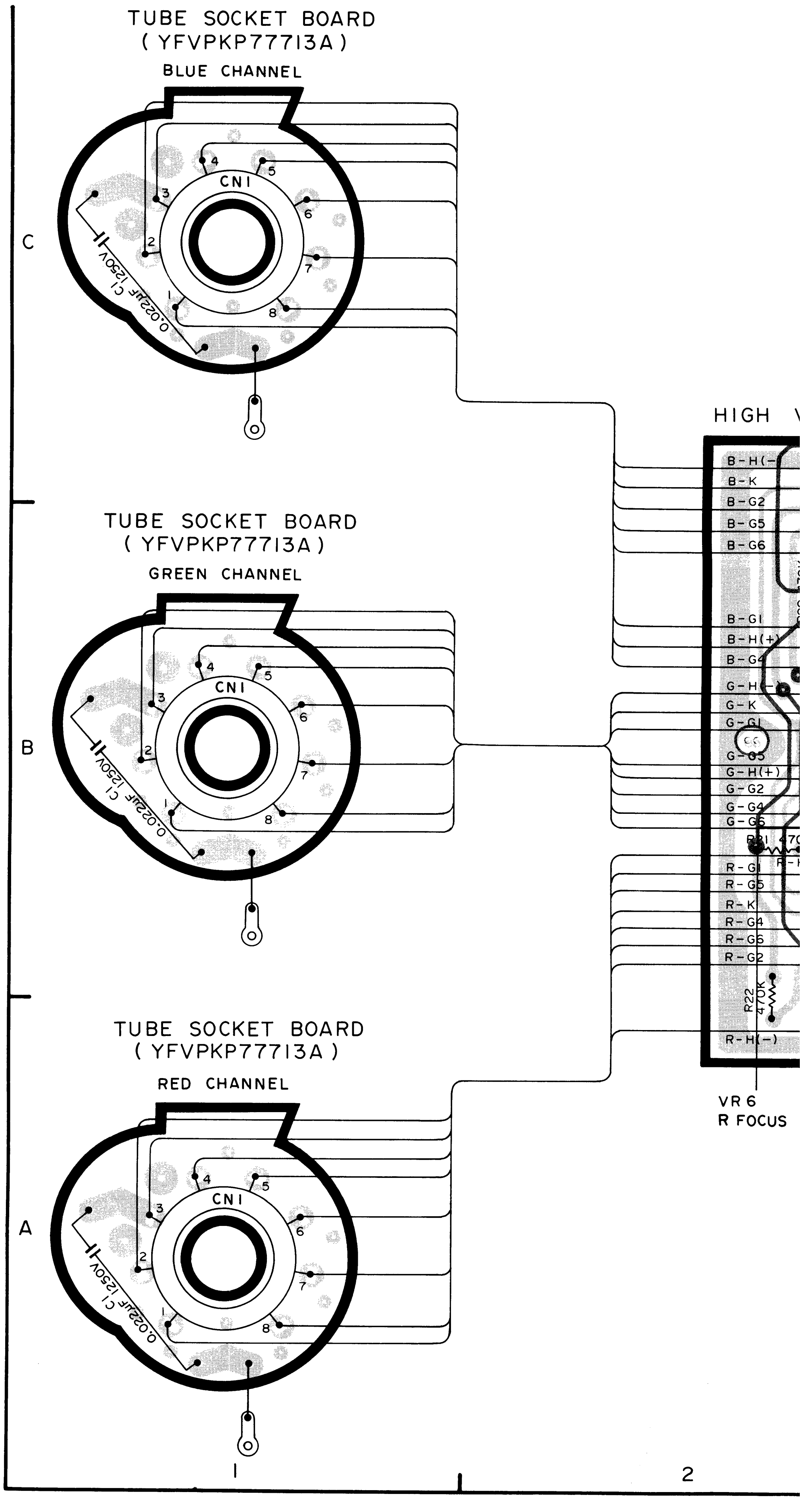
YUD-XZ051



YUDSIR150


K
K
Red
Gold
A
A

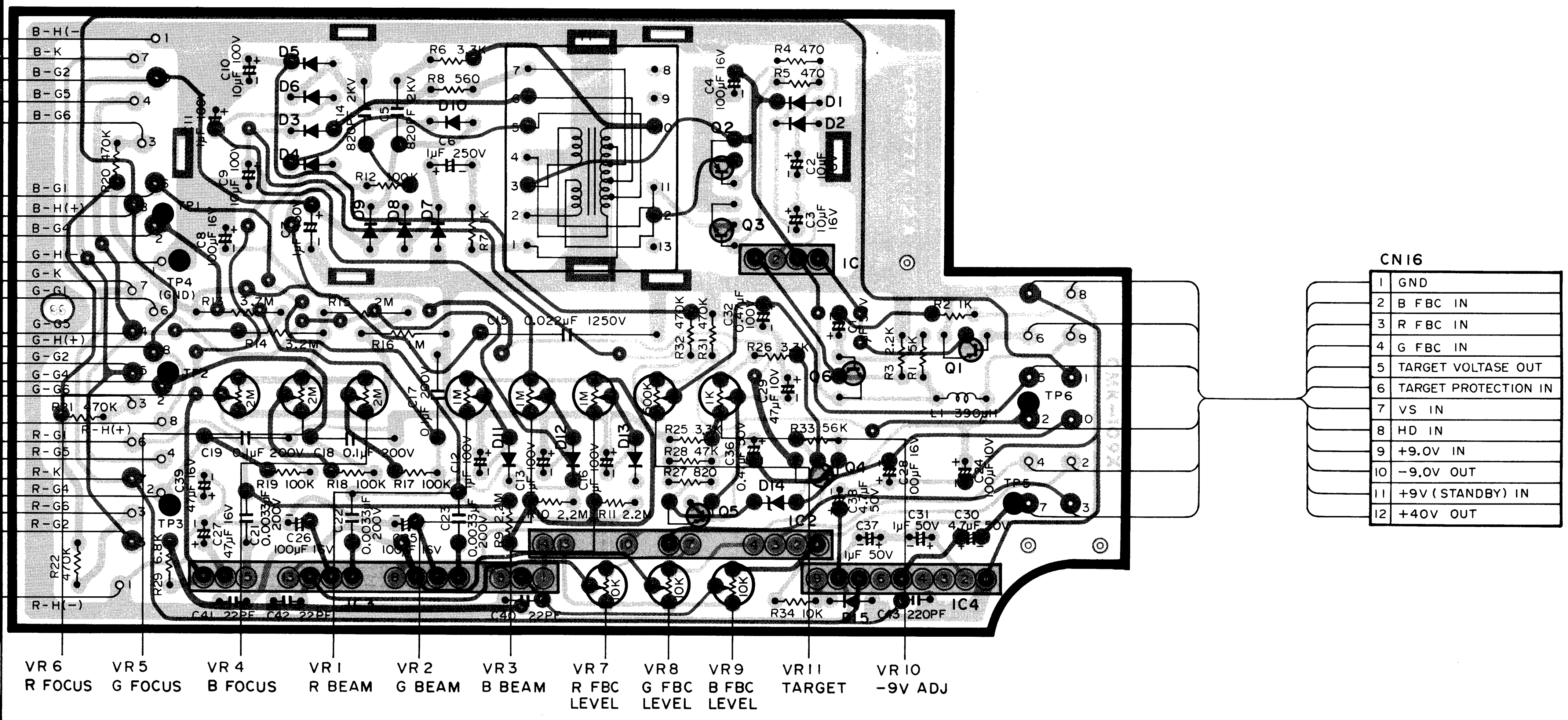
CONDUCTOR VIEW OF HIGH


TUBE SOCKET BOARD
(YFVPKP77713A)
BLUE CHANNEL
C
CN1
1
2
3
4
5
6
7
8
C1 0.022μF 1250V
TUBE SOCKET BOARD
(YFVPKP77713A)
GREEN CHANNEL
B
CN1
1
2
3
4
5
6
7
8
C1 0.022μF 1250V
TUBE SOCKET BOARD
(YFVPKP77713A)
RED CHANNEL
A
CN1
1
2
3
4
5
6
7
8
C1 0.022μF 1250V
HIGH
B-H(-
B-K
B-G2
B-G5
B-G6
B-G1
B-H(+)
B-G4
G-H
G-K
G-G1
G-G5
G-H(+)
G-G2
G-G4
G-G6
R21 470
R-G1
R-G5
R-K
R-G4
R-G6
R-G2
R22 470K
R-H(-)
VR 6
R FOCUS
1
2

IC1	DN819	B4	Q1	2SB641-RS	B4	D1	MA150
IC2	EHMS727S40S	B3, B4	Q2	2SA684-RS	B4	D2	MA150
IC3	EHMSU27W71S	A2, A3, B2, B3	Q3	2SC1384-RS	B4	D3	YUDERB1
IC4	EHMSJ13W72	A4, B4	Q4	2SD636-RS	B4	D4	YUDERB1
			Q5	2SB641-RS	B4	D5	YUDERB1
			Q6	2SD636-RS	B4	D6	YUDERB1

HIGH VOLTAGE BOARD

HIGH VOLTAGE BOARD (YFVPKP77712A)


B-H(-)
B-K
B-G2
B-G5
B-G6
B-G1
B-H(+)
B-G4
G-H(-)
G-K
G-G1
G-G5
G-H(+)
G-G2
G-G4
G-G6
R-G1
R-G5
R-K
R-G4
R-G6
R-G2
R-H(+)
R-H(-)
TP1
TP2
TP3
TP4 (GND)
TP5
TP6
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13
D14
D15
Q1
Q2
Q3
Q4
Q5
Q6
IC1
IC2
IC3
IC4
R4 470
R5 470
R6 3.3K
R8 560
R12 100K
R15 2M
R16 M
R14 3.2M
R13 3.3M
R2 1K
R26 3.3K
R25 3.3K
R28 47K
R27 820
R33 56K
R32 470K
R31 470K
R34 10K
R19 100K
R18 100K
R17 100K
R10 2.2M
R11 2.2M
R21 470K
R20 470K
R22 470K
R29 5.6K
C4 100μF 16V
C2 10μF
C3 10μF 16V
C10 10μF 100V
C9 10μF 100V
C8 100μF 16V
C14 820PF 2KV
C5 820PF 2KV
C6 1μF 250V
C15 0.022μF 1250V
C19 0.1μF 200V
C18 0.1μF 200V
C17 0.1μF 200V
C12 1μF 100V
C13 1μF 100V
C16 1μF 100V
C26 100μF 16V
C25 100μF 16V
C21 0.0033μF 200V
C22 0.0033μF 200V
C23 0.0033μF 200V
C27 47μF 16V
C39 47μF 16V
C29 47μF 10V
C36 0.47μF 50V
C28 100μF 16V
C34 100μF 10V
C37 1μF 50V
C31 1μF 50V
C30 4.7μF 50V
C41 22PF
C42 22PF
C40 22PF
C43 220PF
L1 390μH
2M
2M
2M
1M
1M
1M
500K
1K
10K
10K
10K
CN16
VR6 R FOCUS
VR5 G FOCUS
VR4 B FOCUS
VR1 R BEAM
VR2 G BEAM
VR3 B BEAM
VR7 R FBC LEVEL
VR8 G FBC LEVEL
VR9 B FBC LEVEL
VR11 TARGET
VR10 -9V ADJ

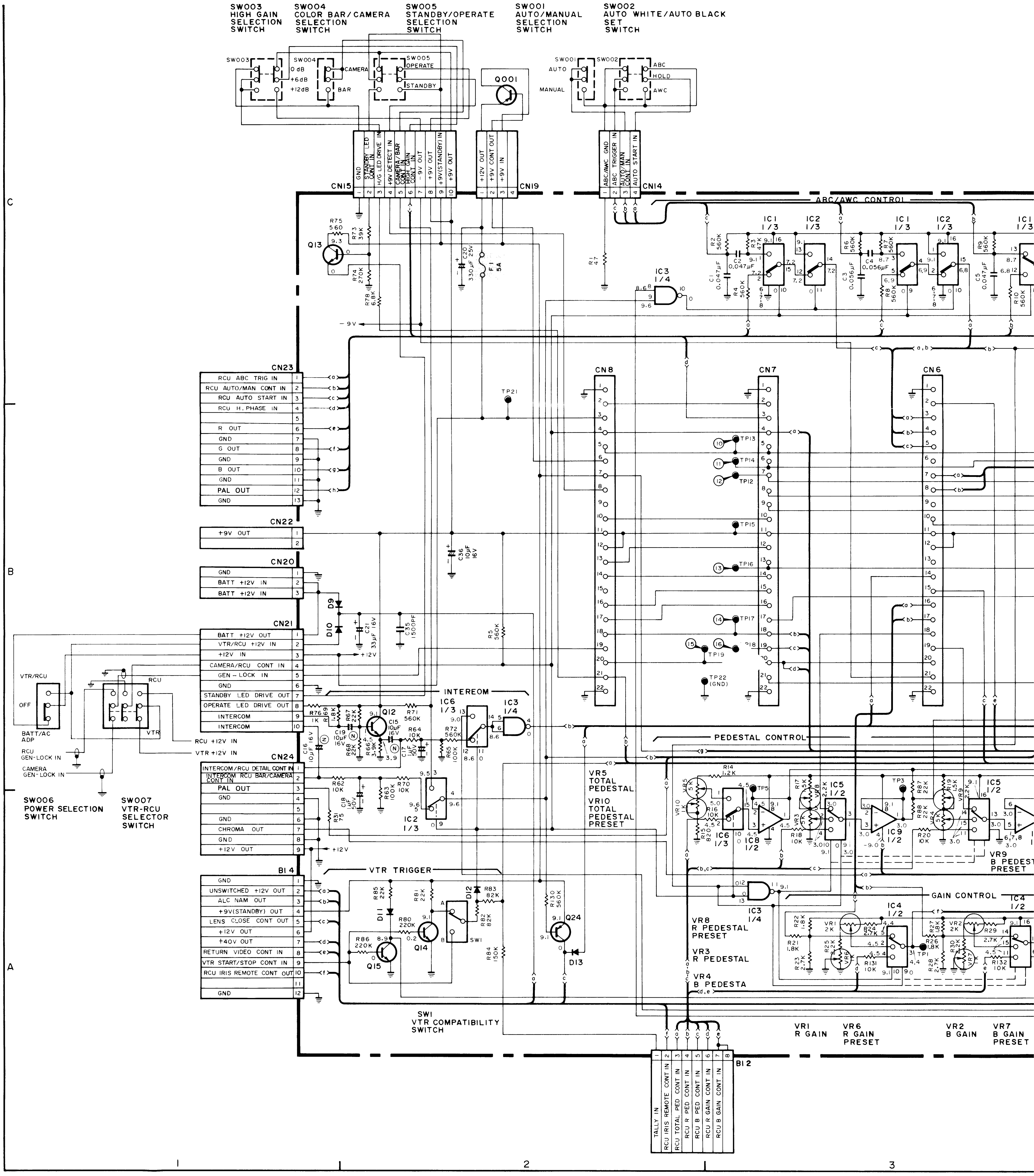
CN16

1	GND
2	B FBC IN
3	R FBC IN
4	G FBC IN
5	TARGET VOLTASE OUT
6	TARGET PROTECTION IN
7	VS IN
8	HD IN
9	+9.0V IN
10	-9.0V OUT
11	+9V (STANDBY) IN
12	+40V OUT

3 4 5

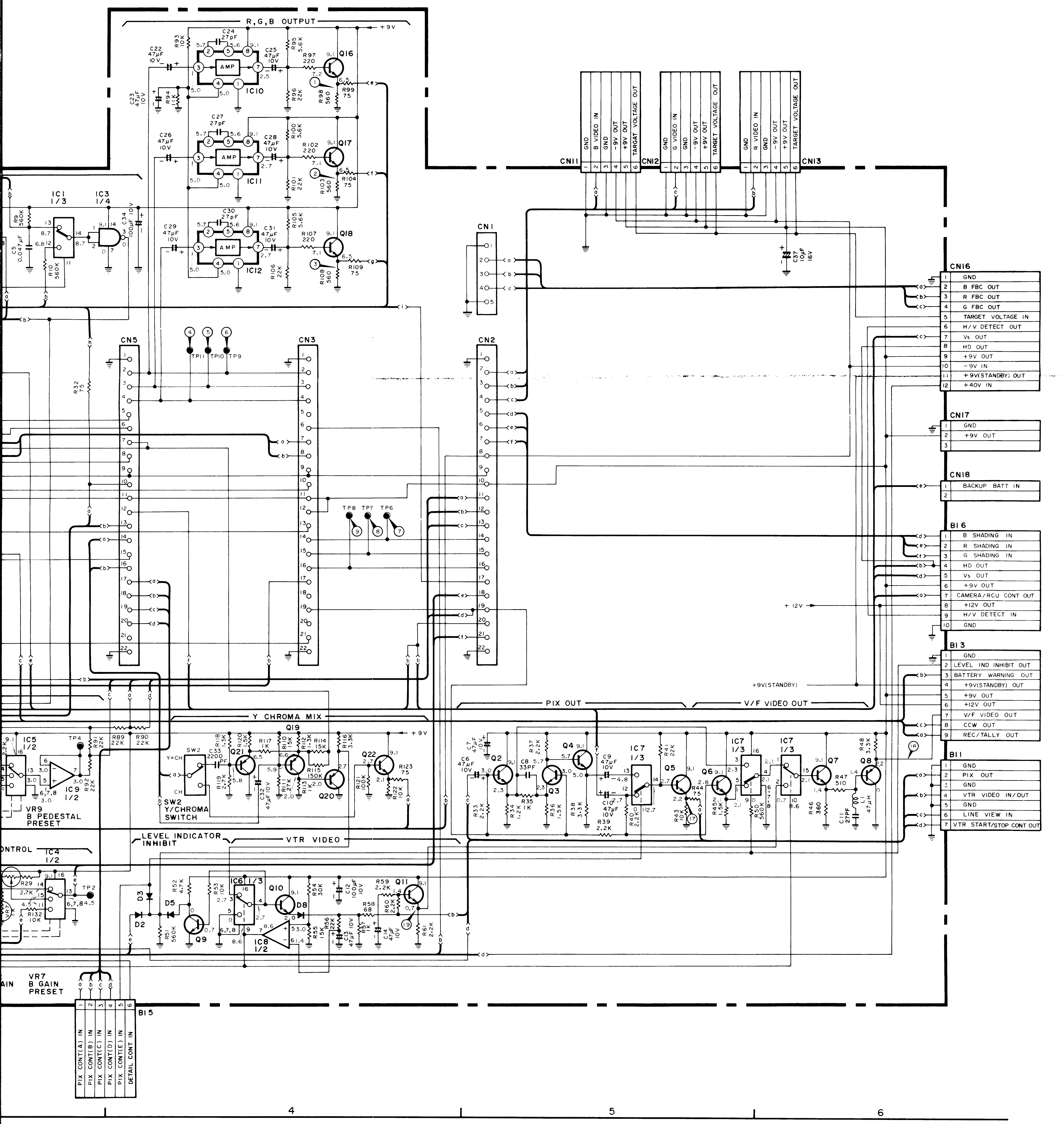
MA150	B4	D7	YUDSIR60	B3	D13	MA162	B3
MA150	B4	D8	YUDSIR60	B3	D14	YUD-XZ051	B4
YUDERB12-02	B3	D9	YUDSIR150	B3	D15	MA150	A4
YUDERB12-02	B3	D10	YUDSIR150	B3			
YUDERB12-02	C3	D11	MA162	B3			
YUDERB12-02	B3	D12	MA162	B3			

SCHEMATIC DIAGRA


SW003 HIGH GAIN SELECTION SWITCH
SW004 COLOR BAR/CAMERA SELECTION SWITCH
SW005 STANDBY/OPERATE SELECTION SWITCH
SW001 AUTO/MANUAL SELECTION SWITCH
SW002 AUTO WHITE/AUTO BLACK SET SWITCH
0 dB
+6dB
+12dB
CAMERA
BAR
OPERATE
STANDBY
AUTO
MANUAL
ABC
HOLD
AWC
Q001
CN15
CN19
CN14
GND
STANDBY LED CONT IN
H/G LED DRIVE IN
+9V DETECT IN
CAMERA/BAR CONT IN
HIGH GAIN CONT IN
+9V OUT
+9V OUT
+9V(STANDBY) OUT
+9V OUT
+12V OUT
+9V CONT OUT
+9V IN
ABC/AWC GND
ABC TRIGGER IN
AUTO/MAN CONT IN
AUTO START IN
ABC/AWC CONTROL
IC1 1/3
IC2 1/3
IC3 1/4
Q13
F1 5A
CN23
RCU ABC TRIG IN
RCU AUTO/MAN CONT IN
RCU AUTO START IN
RCU H. PHASE IN
R OUT
G OUT
B OUT
PAL OUT
CN22
+9V OUT
CN20
BATT +12V IN
CN21
BATT +12V OUT
VTR/RCU +12V IN
+12V IN
CAMERA/RCU CONT IN
GEN-LOCK IN
STANDBY LED DRIVE OUT
OPERATE LED DRIVE OUT
INTERCOM
CN24
INTERCOM/RCU DETAIL CONT IN
INTERCOM RCU BAR/CAMERA CONT IN
CHROMA OUT
+12V OUT
B14
UNSWITCHED +12V OUT
ALC NAM OUT
+9V(STANDBY) OUT
LENS CLOSE CONT OUT
+40V OUT
RETURN VIDEO CONT IN
VTR START/STOP CONT IN
RCU IRIS REMOTE CONT OUT
VTR/RCU
OFF
BATT/AC ADP
RCU GEN-LOCK IN
CAMERA GEN-LOCK IN
RCU +12V IN
VTR +12V IN
SW006 POWER SELECTION SWITCH
SW007 VTR-RCU SELECTOR SWITCH
INTERCOM
IC6 1/3
IC3 1/4
Q12
IC2 1/3
VTR TRIGGER
Q14
Q15
SW1
Q24
D13
SW1 VTR COMPATIBILITY SWITCH
CN8
CN7
CN6
TP21
TP22 (GND)
PEDESTAL CONTROL
VR5 TOTAL PEDESTAL
VR10 TOTAL PEDESTAL PRESET
IC6 1/3
IC8 1/2
IC5 1/2
IC9 1/2
VR9 B PEDESTAL PRESET
GAIN CONTROL
IC4 1/2
VR8 R PEDESTAL PRESET
VR3 R PEDESTAL
VR4 B PEDESTAL
VR1 R GAIN
VR6 R GAIN PRESET
VR2 B GAIN
VR7 B GAIN PRESET
B12
TALLY IN
RCU IRIS REMOTE CONT IN
RCU TOTAL PED CONT IN
RCU R PED CONT IN
RCU B PED CONT IN
RCU R GAIN CONT IN
RCU B GAIN CONT IN
C
B
A
1
2
3

IC 1	YFHD14053BP	C2, C3	IC8	YHSNJM4558D	A2, A3	Q2	2SD636-RS	A4	Q11	2SC2377-CD
IC 2	YFHD14053BP	C2, C3	IC9	YHSNJM4558D	A2, A3	Q3	2SD636-RS	A4	Q12	2SD636-RS
IC 3	YFHD14011BP	A2, B1, C2, C3	IC10	EHMS111H40SA	C3	Q4	2SD636-RS	A4	Q13	2SD661-TU
IC 4	YWHD14052BP	A2, A3	IC11	EHMS111H40SA	C3	Q5	2SD638-QR	A4	Q14	2SD636-RS
IC 5	YWHD14052BP	A2, A3	IC12	EHMS111H40SA	C3	Q6	2SC2377-CD	A5	Q15	2SD636-RS
IC 6	YFHD14053BP	A2, A3, B1				Q7	2SC2377-CD	A5	Q16	2SD661-TU
IC 7	YFHD14053BP	A4, A5				Q8	2SA1254-BC	A5	Q17	2SD661-TU
						Q9	2SD636-RS	A3	Q18	2SD661-TU
						Q10	2SD638-QR	A3		

AGRAM OF MOTHER BOARD



R,G,B OUTPUT
+9V
IC10
IC11
IC12
AMP
Q16
Q17
Q18
IC1 1/3
IC3 1/4
CN11
CN12
CN13
GND
B VIDEO IN
G VIDEO IN
R VIDEO IN
-9V OUT
+9V OUT
TARGAT VOLTAGE OUT
TARGET VOLTAGE OUT
CN1
CN5
CN3
CN2
TP11
TP10
TP9
TP8
TP7
TP6
CN16
GND
B FBC OUT
R FBC OUT
G FBC OUT
TARGET VOLTAGE IN
H/V DETECT OUT
Vs OUT
HD OUT
+9V OUT
-9V IN
+9V(STANDBY) OUT
+40V IN
CN17
GND
+9V OUT
CN18
BACKUP BATT IN
BI6
B SHADING IN
R SHADING IN
G SHADING IN
HD OUT
Vs OUT
+9V OUT
CAMERA/RCU CONT OUT
+12V OUT
H/V DETECT IN
GND
+12V
BI3
GND
LEVEL IND INHIBIT OUT
BATTERY WARNING OUT
+9V(STANDBY) OUT
+9V OUT
+12V OUT
V/F VIDEO OUT
CCW OUT
REC/TALLY OUT
BI1
GND
PIX OUT
GND
VTR VIDEO IN/OUT
GND
LINE VIEW IN
VTR START/STOP CONT OUT
+9V(STANDBY)
PIX OUT
V/F VIDEO OUT
Y CHROMA MIX
Q19
Q20
Q21
Q22
Q2
Q3
Q4
Q5
Q6
Q7
Q8
IC7 1/3
IC5 1/2
IC9 1/2
SW2 Y/CHROMA SWITCH
VR9 B PEDESTAL PRESET
LEVEL INDICATOR INHIBIT
VTR VIDEO
CONTROL
IC4 1/2
IC6 1/3
IC8 1/2
Q9
Q10
Q11
D2
D3
D5
D8
TP2
TP4
VR7 B GAIN PRESET
BI5
PIX CONT(A) IN
PIX CONT(B) IN
PIX CONT(C) IN
PIX CONT(D) IN
PIX CONT(E) IN
DETAIL CONT IN
4
5
6

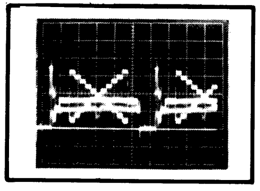
2377-CD	A4	Q19	2SB641-RS	A3	D2	MA165	A3	D11	MA165	A1
636-RS	B1	Q20	2SB641-RS	A3	D3	MA165	A3	D12	MA165	A1
661-TU	C1	Q21	2SB641-RS	A3	D5	MA165	A3	D13	MA165	A1
636-RS	A1	Q22	2SD636-RS	A4	D8	MA165	A3			
636-RS	A1	Q24	2SB641-RS	A1	D9	YUDRM-1Z	B1			
661-TU	C4				D10	YUDRM-1Z	B1			
661-TU	C4									
661-TU	C4									

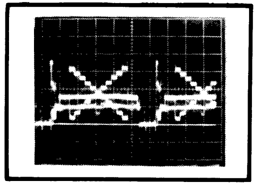
PRODUCT SAFETY NOTE

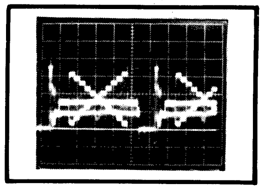
The shaded area on this schematic diagram incorporates special featur
portant for protection from X-Radiation, fire and electrical shock ha
When servicing it is essential that only manufacturer's specified parts be
for the critical components in the shaded areas of the schematic.

SIGNAL WAVEFORMS OF MOTHER BOARD

CONDUCT


1 0.5V/DIV, 10μs/DIV


2 0.5V/DIV, 10μs/DIV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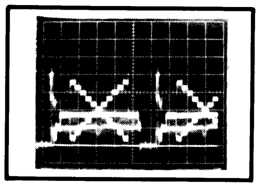
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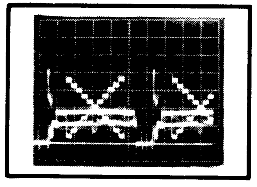
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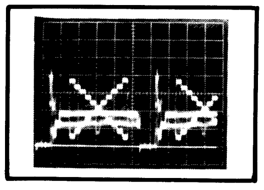
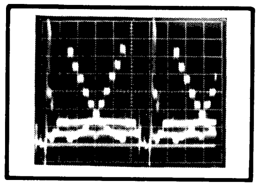
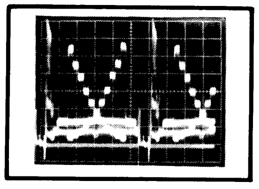
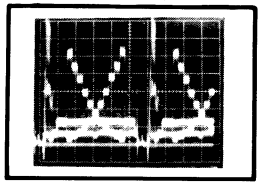
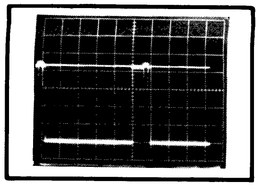
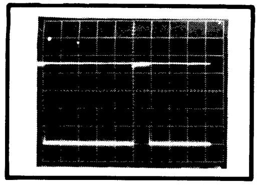

6 0.2V/DIV, 10μs/DIV

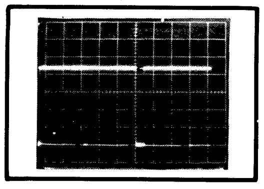

7 0.2V/DIV, 10μs/DIV

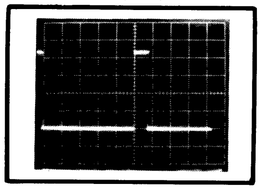

8 0.2V/DIV, 10μs/DIV

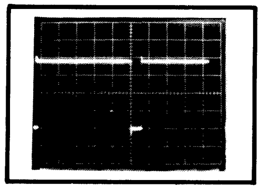

9 0.2V/DIV, 10μs/DIV

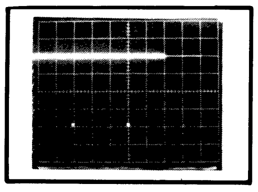

10 2V/DIV, 10μs/DIV

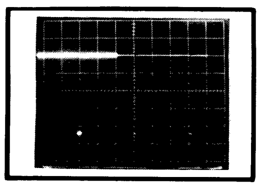

11 2V/DIV, 10μs/DIV


12 2V/DIV, 10μs/DIV


13 2V/DIV, 10μs/DIV


14 2V/DIV, 10μs/DIV


15 2V/DIV, 5ms/DIV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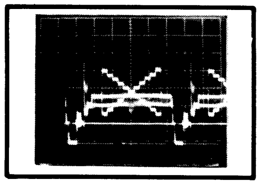
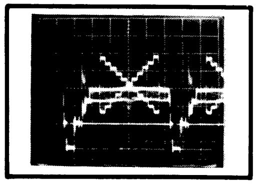
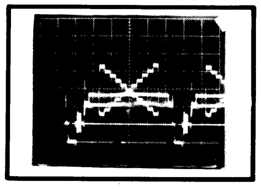

17 0.5V/DIV, 10μs/DIV


18 0.2V/DIV, 10μs/DIV


19 0.2V/DIV, 10μs/DIV

CN23

RCU ABC TRIG IN	1
RCU AUTO/MAN CONT IN	2
RCU AUTO START IN	3
RCU H. PHASE IN	4
	5
R OUT	6
GND	7
G OUT	8
GND	9
B OUT	10
GND	11
PAL OUT	12
GND	13

CN 19

+12V OUT	1
+9V CONT OUT	2
+9V IN	3
	4

CN20

GND	1
BATT +12V IN	2
BATT +12V IN	3

CN 21

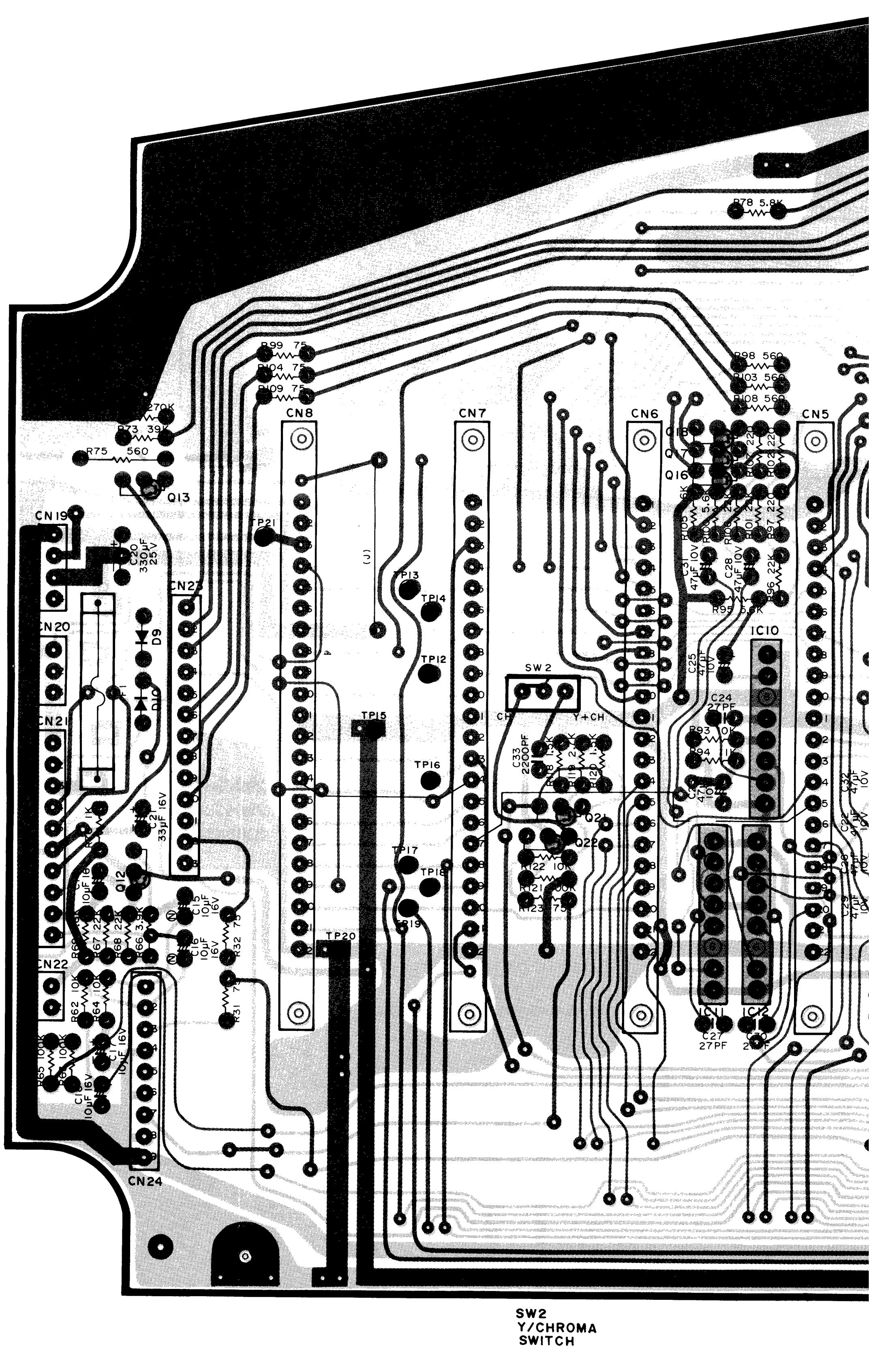
BATT +12V OUT	1
VTR/RCU +12V IN	2
+12V IN	3
CAMERA/RCU CONT IN	4
GEN – LOCK IN	5
GND	6
STANDBY LED DRIVE OUT	7
OPERATE LED DRIVE OUT	8
INTERCOM	9
INTERCOM	10

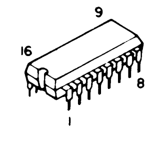
CN 22

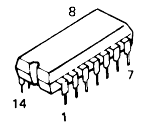
+9V OUT	1
	2

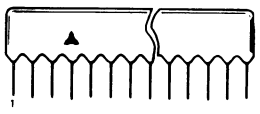
CN 24

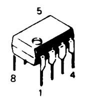
INTERCOM / RCU DETAIL CONT IN	1
INTERCOM RCU BAR / CAMERA CONT IN	2
PAL OUT	3
GND	4
	5
GND	6
CHROMA OUT	7
GND	8
+12V OUT	9


D
C
B
A
1
2
3
CN19
CN20
CN21
CN22
CN23
CN24
CN8
CN7
CN6
CN5
IC10
IC11
IC12
Q13
Q16
Q21
Q22
D9
D10
TP12
TP13
TP14
TP15
TP16
TP17
TP18
TP19
TP20
TP21
SW2
CH
Y+CH
R75 560
R73 39
R78 5.8K
R99 75
R104 75
R109 75
R98 560
R103 560
R108 560
C27 27PF
C24 27PF
C33 220PF
C10 330μF 25V
SW2
Y/CHROMA
SWITCH

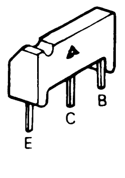

YWHD14052BP
YFHD14053BP


YFHD14011BP

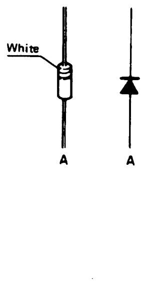

EHMS111H40SA


YHSNJM4558D

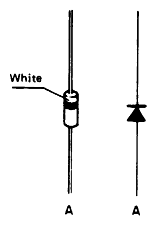
2SA1254-BC
2SB641-RS
2SC2377-CD
2SD636-RS
2SD638-QR
2SD661-TU



MA165

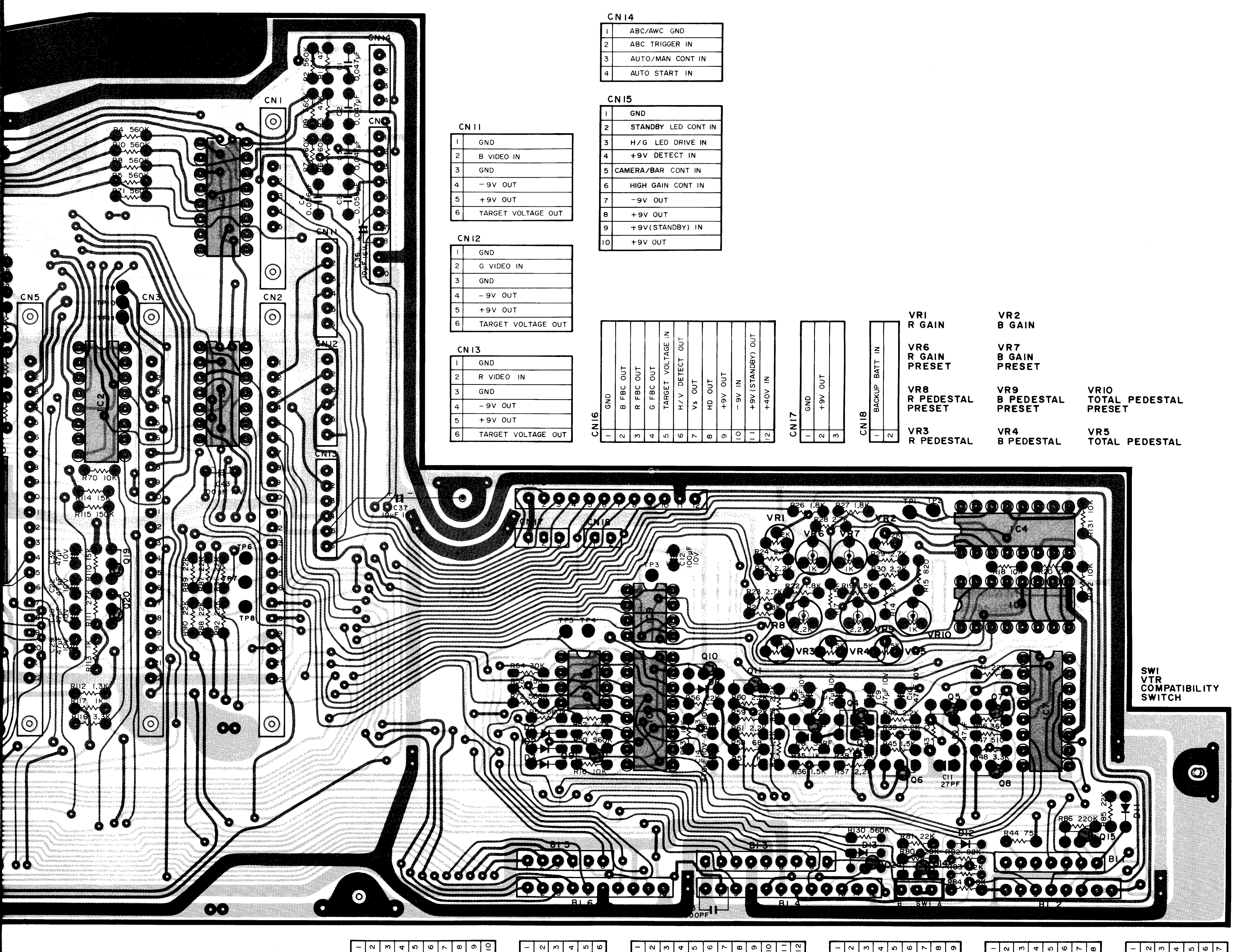


YUDRM-1Z



IC1	YFHD14053BP	D4
IC2	YFHD14053BP	C4
IC3	YFHD14011BP	C4
IC4	YWHD14052BP	C7, C8
IC5	YWHD14052BP	B7, B8
IC6	TFHD14053BP	B6
IC7	YFHD14053BP	B8
IC8	YHSNJM4558D	B6
IC9	YHSNJM4558D	B6
IC10	EHMS111H40SA	B3, C3
IC11	EHMS111H40SA	B3
IC12	EHMS111H40SA	B3
Q2	2SD636-RS	B7
Q3	2SD636-RS	B7
Q4	2SD636-RS	B7
Q5	2SD638-QR	B7
Q6	2SC2377-CD	B7
Q7	2SC2377-CD	B7
Q8	2SA1254-BC	B7

UCTOR VIEW OF MOTHER BOARD


CN1
CN2
CN3
CN5
CN11
CN12
CN13
CN14
CN15
CN16
CN18
IC2
IC4
TP1
TP3
TP4
TP5
TP6
TP7
TP8
VR1
VR2
VR3
VR4
VR5
VR6
VR7
VR8
VR9
VR10
Q5
Q6
Q8
Q10
Q11
Q15
Q19
Q20
D11
D12
D13
C11 27PF
C12 100μF 10V
C37 10μF
R4 560K
R10 560K
R8 560K
R5 560K
R71 560K
R70 10K
R114 15K
R115 15K
R112 1.3K
R117 1K
R116 3.3K
R26 1.8K
R27 1.8K
R28 2.7K
R29 2.7K
R30 2.2
R15 820
R131 10K
R18 10K
R36 1.5K
R44 75
R86 220K
R85 22K
R130 560K
R80
R81 22K
R82 82K
R83
R84
R54 30K
R16 10K
B1 1
B1 2
B1 3
B1 4
B1 5
B1 6
SW1
B
A

SW1
VTR
COMPATIBILITY
SWITCH

VR1
R GAIN

VR2
B GAIN

VR6
R GAIN
PRESET

VR7
B GAIN
PRESET

VR8
R PEDESTAL
PRESET

VR9
B PEDESTAL
PRESET

VR10
TOTAL PEDESTAL
PRESET

VR3
R PEDESTAL

VR4
B PEDESTAL

VR5
TOTAL PEDESTAL

CN14

1	ABC/AWC GND
2	ABC TRIGGER IN
3	AUTO/MAN CONT IN
4	AUTO START IN

CN15

1	GND
2	STANDBY LED CONT IN
3	H/G LED DRIVE IN
4	+9V DETECT IN
5	CAMERA/BAR CONT IN
6	HIGH GAIN CONT IN
7	-9V OUT
8	+9V OUT
9	+9V(STANDBY) IN
10	+9V OUT

CN11

1	GND
2	B VIDEO IN
3	GND
4	-9V OUT
5	+9V OUT
6	TARGET VOLTAGE OUT

CN12

1	GND
2	G VIDEO IN
3	GND
4	-9V OUT
5	+9V OUT
6	TARGET VOLTAGE OUT

CN13

1	GND
2	R VIDEO IN
3	GND
4	-9V OUT
5	+9V OUT
6	TARGET VOLTAGE OUT

CN16

1	GND
2	B FBC OUT
3	R FBC OUT
4	G FBC OUT
5	TARGET VOLTAGE IN
6	H/V DETECT OUT
7	Vs OUT
8	HD OUT
9	+9V OUT
10	-9V IN
11	+9V (STANDBY) OUT
12	+40V IN

CN17

1	GND
2	+9V OUT
3	

CN18

1	BACKUP BATT IN
2	

BI 6

1	B SHADING IN
2	R SHADING IN
3	G SHADING IN
4	HD OUT
5	Vs OUT
6	+9V OUT
7	CAMERA/RCU CONT OUT
8	+12V OUT
9	H/V DETECT IN
10	GND

BI 5

1	PIX CONT(A) IN
2	PIX CONT(B) IN
3	PIX CONT(C) IN
4	PIX CONT(D) IN
5	PIX CONT(E) IN
6	DETAIL CONT IN

BI 4

1	GND
2	UNSWITCHED +12V OUT
3	ALC NAM OUT
4	+9V(STANDBY) OUT
5	LENS CLOSE CONT OUT
6	+12V OUT
7	+40V OUT
8	RETURN VIDEO CONT IN
9	VTR START/STOP CONT IN
10	RCU IRIS REMOTE CONT OUT
11	
12	GND

BI 3

1	GND
2	LEVEL IND INHIBIT OUT
3	BATTERY WARNING OUT
4	+9V(STANDBY) OUT
5	+9V OUT
6	+12V OUT
7	V/F VIDEO OUT
8	CCW OUT
9	REC/TALLY OUT

BI 2

1	TALLY IN
2	RCU IRIS REMOTE CONT IN
3	RCU TOTAL PED CONT IN
4	RCU R PED CONT IN
5	RCU B PED CONT IN
6	RCU R GAIN CONT IN
7	RCU B GAIN CONT IN
8	

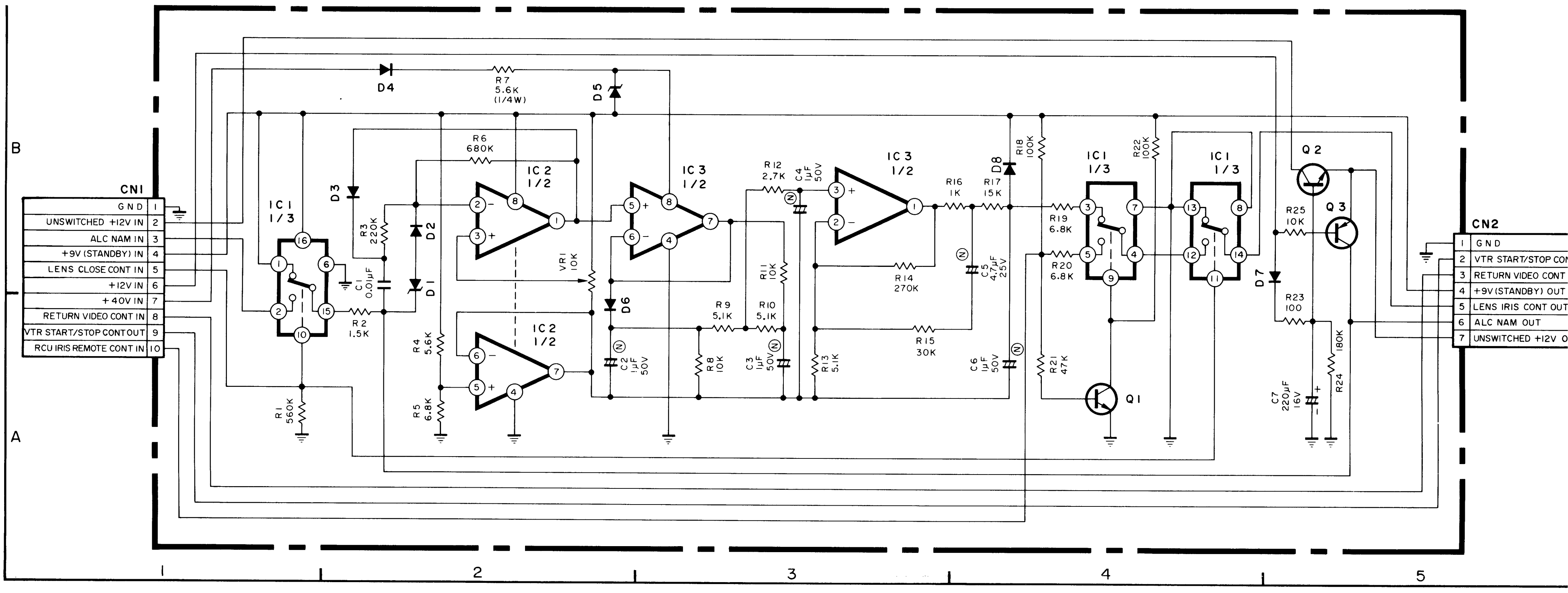
BI 1

1	GND
2	PIX OUT
3	GND
4	VTR VIDEO IN/OUT
5	GND
6	LINE VIEW IN
7	VTR START/STOP CONT OUT

4 5 6 7 8

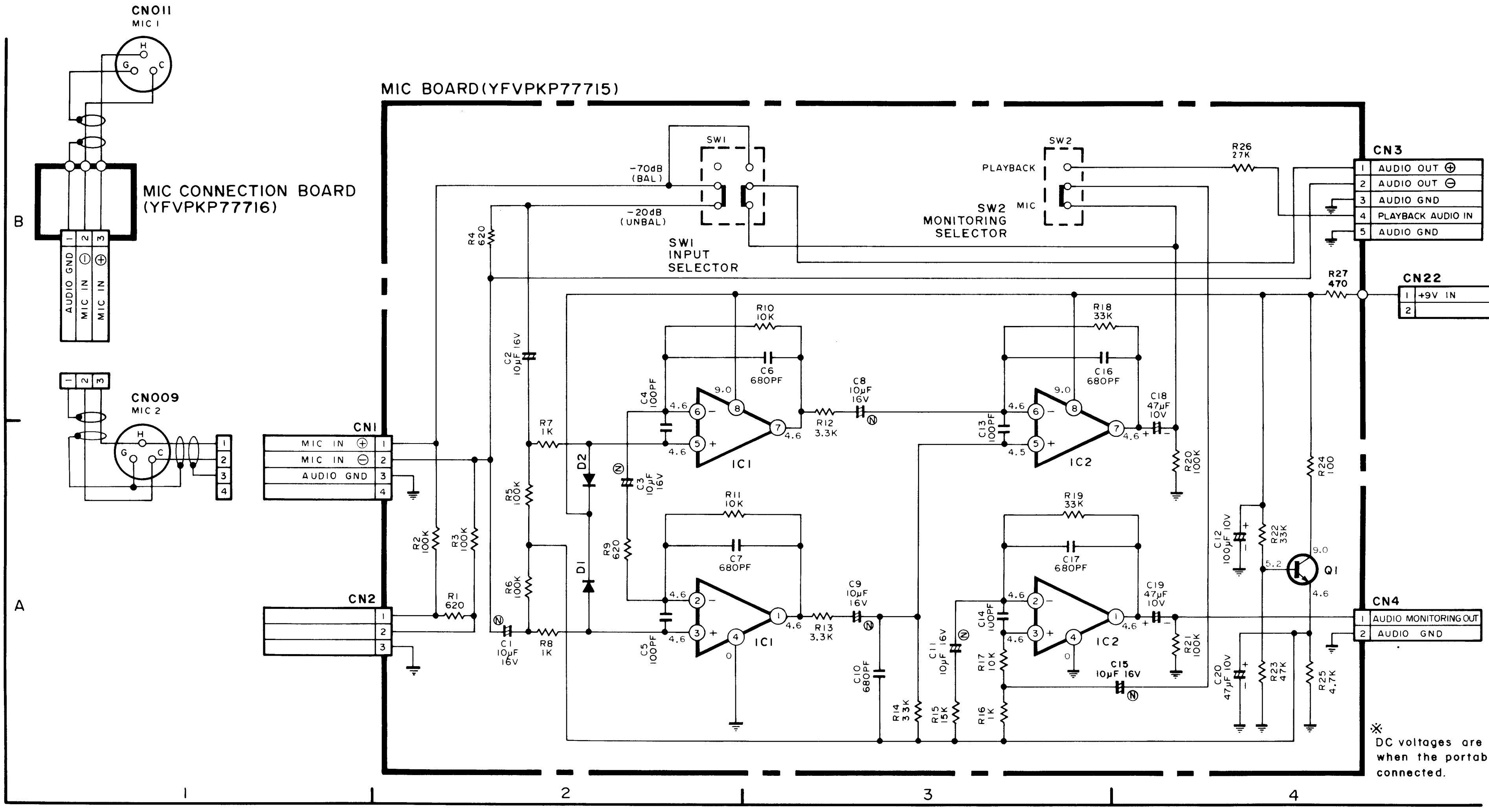
Q9	2SD636-RS	B6	Q17	2SD661-TU	C3	D2	MA165	B6
Q10	2SD638-QR	B6	Q18	2SD661-TU	C3	D3	MA165	B6
Q11	2SC2377-CD	B6	Q19	2SB641-RS	B4, C4	D5	MA165	B6
Q12	2SD636-RS	B1	Q20	2SB641-RS	B4	D8	MA165	B6
Q13	2SD661-TU	C1	Q21	2SB641-RS	B3	D9	YUDRM-1Z	C1
Q14	2SD636-RS	A7	Q22	2SD636-RS	B3	D10	YUDRM-1Z	C1
Q15	2SD636-RS	A8, B8	Q24	2SB641-RS	A7	D11	MA165	B8
Q16	2SD661-TU	C3				D12	MA165	A7, B7
						D13	MA165	A7

SCHEMATIC DIAGRAM OF AIC BOARD


CN1
1 GND
2 UNSWITCHED +12V IN
3 ALC NAM IN
4 +9V (STANDBY) IN
5 LENS CLOSE CONT IN
6 +12V IN
7 +40V IN
8 RETURN VIDEO CONT IN
9 VTR START/STOP CONT OUT
10 RCU IRIS REMOTE CONT IN
CN2
1 GND
2 VTR START/STOP CON
3 RETURN VIDEO CONT
4 +9V (STANDBY) OUT
5 LENS IRIS CONT OUT
6 ALC NAM OUT
7 UNSWITCHED +12V O
IC1 1/3
IC2 1/2
IC3 1/2
D1
D2
D3
D4
D5
D6
D7
D8
R1 560K
R2 1.5K
R3 220K
R4 5.6K
R5 6.8K
R6 680K
R7 5.6K (1/4W)
R8 10K
R9 5.1K
R10 5.1K
R11 10K
R12 2.7K
R13 5.1K
R14 270K
R15 30K
R16 1K
R17 15K
R18 100K
R19 6.8K
R20 6.8K
R21 47K
R22 100K
R23 100
R24 180K
R25 10K
C1 0.01μF
C2 1μF 50V
C3 1μF 50V
C4 1μF 50V
C5 4.7μF 25V
C6 1μF 50V
C7 220μF 16V
VR1 10K
Q1
Q2
Q3
A
B
1
2
3
4
5

IC1	YFHD14053BP	A1, B1, A4	Q1	2SD636-RS	A4	D1	05Z2.7	A2, B2	D5	YUD-XZ051	B2
IC2	YHSNJM4558D	A2, B2	Q2	2SD638-RS	B5	D2	MA165	B2	D6	MA165	A2, B2
IC3	YHSNJM4558D	B2, B3	Q3	2SB641-RS	B5	D3	MA165	B2	D7	MA165	B4, B5
						D4	MA165	B2	D8	MA165	B4

SCHEMATIC DIAGRAM OF MIC BOARD

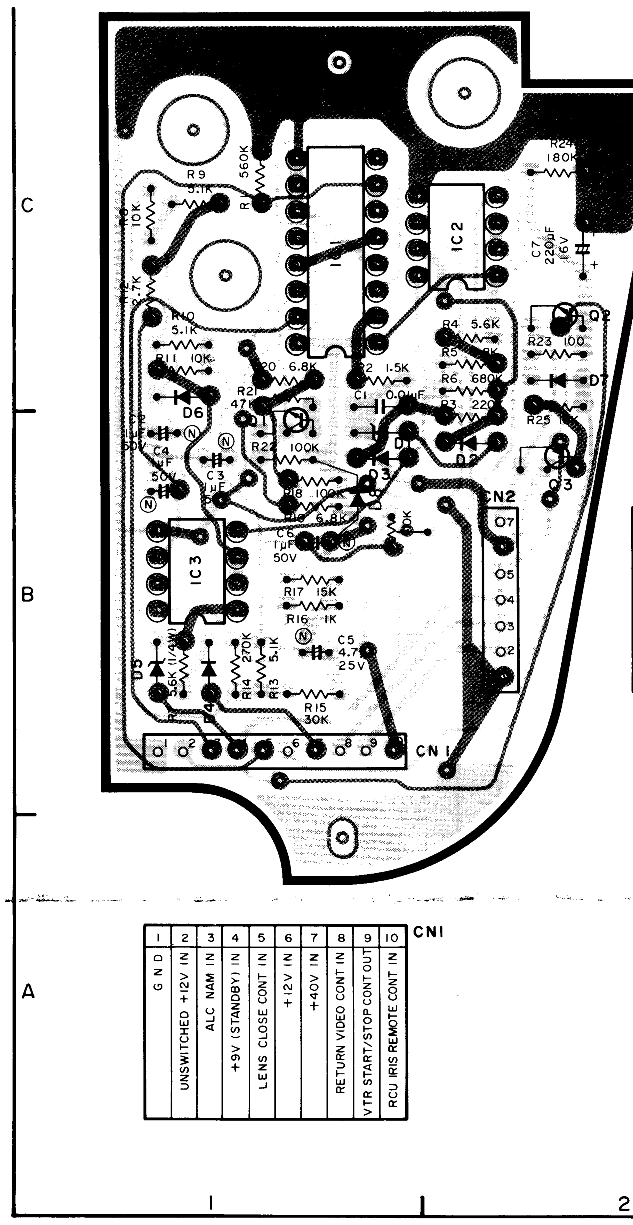

CN011
MIC 1
MIC CONNECTION BOARD (YFVPKP77716)
AUDIO GND
MIC IN ⊖
MIC IN ⊕
CN009
MIC 2
MIC BOARD (YFVPKP77715)
CN1
1 MIC IN ⊕
2 MIC IN ⊖
3 AUDIO GND
CN2
SW1
-70dB (BAL)
-20dB (UNBAL)
SW1 INPUT SELECTOR
SW2
PLAYBACK
MIC
SW2 MONITORING SELECTOR
CN3
1 AUDIO OUT ⊕
2 AUDIO OUT ⊖
3 AUDIO GND
4 PLAYBACK AUDIO IN
5 AUDIO GND
CN22
1 +9V IN
CN4
1 AUDIO MONITORING OUT
2 AUDIO GND
IC1
IC2
Q1
D1
D2
R1 620
R2 100K
R3 100K
R4 620
R5 100K
R6 100K
R7 1K
R8 1K
R9 620
R10 10K
R11 10K
R12 3.3K
R13 3.3K
R14 33K
R15 15K
R16 1K
R17 10K
R18 33K
R19 33K
R20 100K
R21 100K
R22 33K
R23 47K
R24 100
R25 4.7K
R26 27K
R27 470
C1 10μF 16V
C2 10μF 16V
C3 10μF 16V
C4 100PF
C5 100PF
C6 680PF
C7 680PF
C8 10μF 16V
C9 10μF 16V
C10 680PF
C11 10μF 16V
C12 100μF 10V
C13 100PF
C14 100PF
C15 10μF 16V
C16 680PF
C17 680PF
C18 47μF 10V
C19 47μF 10V
C20 47μF 10V
9.0
4.6
4.5
5.2
0
A
B
1
2
3
4

※ DC voltages are measured when the portable VTR is connected.

IC1	YHSNJM4558D	A2, A3, B2, B3	Q1	2SD636-RS	A4	D1	MA165	A2
IC2	YHSNJM4558D	A3, A4, B3, B4				D2	MA165	A2

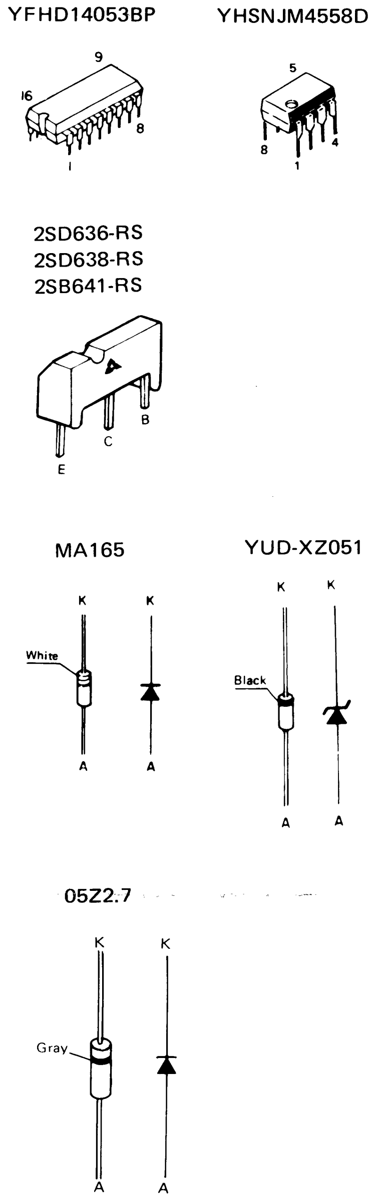
CN2
G N D
VTR START/STOP CONT IN
RETURN VIDEO CONT OUT
+9V (STANDBY) OUT
LENS IRIS CONT OUT
ALC NAM OUT
UNSWITCHED +12V OUT

CONDUCTOR VIEW OF AIC BOARD


C
B
A
1
2
R9 5.1K
R1 560K
R8 10K
R12 2.7K
R10 5.1K
R11 10K
R20 6.8K
R21 47K
R22 100K
R2 1.5K
R4 5.6K
R5
R6 680K
R3 220
R23 100
R24 180K
R25
R18 100K
R19 6.8K
R17 15K
R16 1K
R14 270K
R13 5.1K
R15 30K
5.6K (1/4W)
C1 0.01μF
C2 1μF 50V
C3 1μF
C4 1μF 50V
C5 4.7 25V
C6 1μF 50V
C7 220μF 16V
IC1
IC2
IC3
Q1
Q2
Q3
D1
D2
D3
D4
D5
D6
D7
D8
N
CN1
CN2

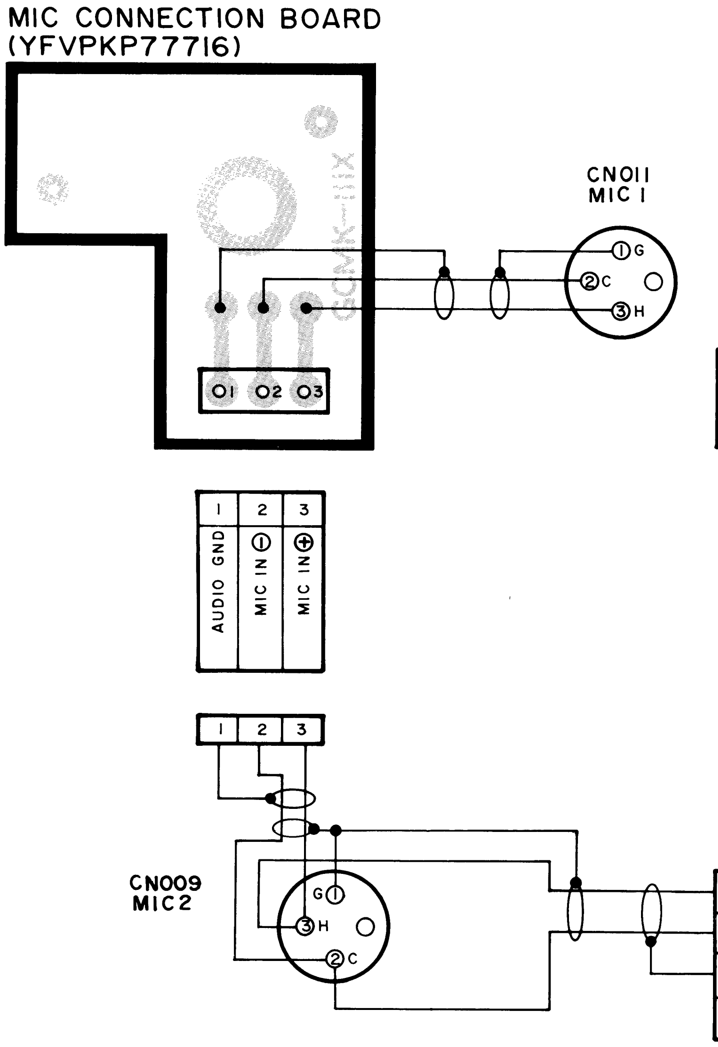
CN1									
1	2	3	4	5	6	7	8	9	10
G N D	UNSWITCHED +12V IN	ALC NAM IN	+9V (STANDBY) IN	LENS CLOSE CONT IN	+12V IN	+40V IN	RETURN VIDEO CONT IN	VTR START/STOP CONT OUT	RCU IRIS REMOTE CONT IN

CN2	
7	UNSWITCHED +12V OUT
6	ALC NAM OUT
5	LENS IRIS CONT OUT
4	+9V (STANDBY) OUT
3	RETURN VIDEO CONT OUT
2	VTR START/STOP CONT IN
1	G N D


YFHD14053BP
9
16
8
1
YHSNJM4558D
5
8
1
4
2SD636-RS
2SD638-RS
2SB641-RS
E
C
B
MA165
K
White
A
YUD-XZ051
K
Black
A
05Z2.7
K
Gray
A

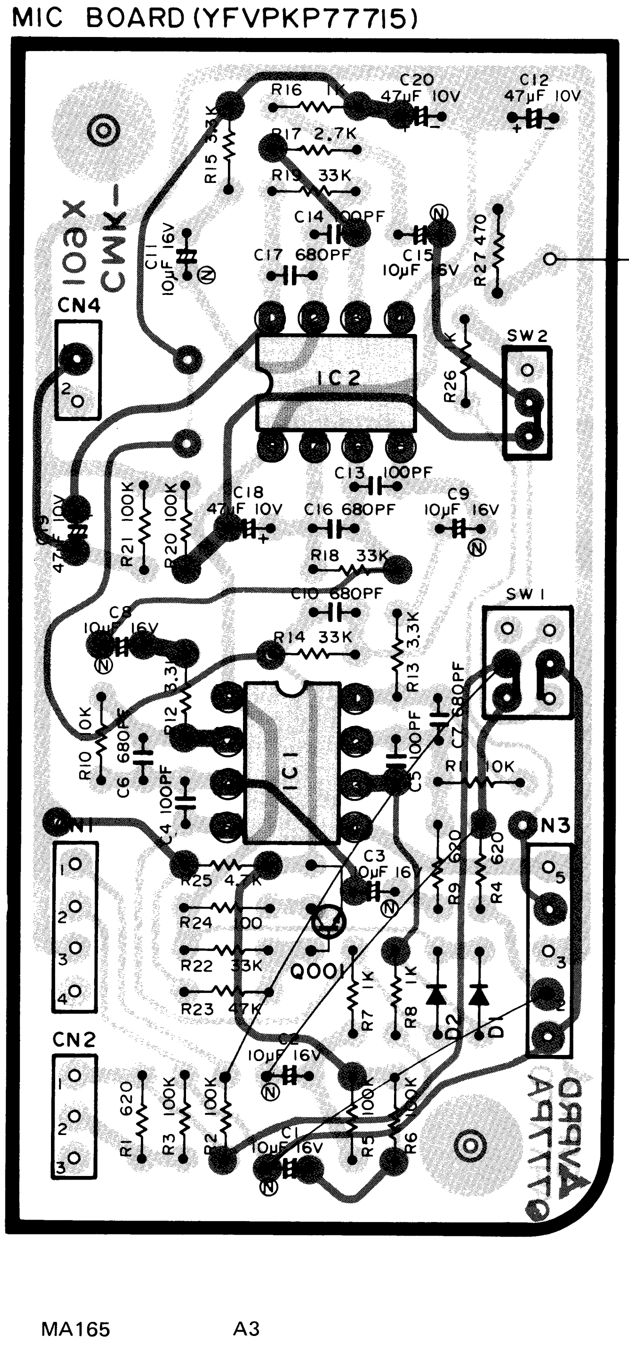
IC1	YFHD14053BP	C1	Q1	2SD636-RS	B1, C1	D1	05Z2.7	B1	D5	YUD-XZ051	B1
IC2	YHSNJM4558D	C1, C2	Q2	2SD638-RS	C2	D2	MA165	B2	D6	MA165	B1, C1
IC3	YHSNJM4558D	B1	Q3	2SB641-RS	B2	D3	MA165	B1	D7	MA165	C2
						D4	MA165	B1	D8	MA165	B1

CONDUCTOR VIEW OF MIC BOARD


MIC CONNECTION BOARD
(YFVPKP77716)
O1 O2 O3
CN011
MIC 1
①G
②C
③H
1 2 3
AUDIO GND
MIC IN ⊖
MIC IN ⊕
1 2 3
CN009
MIC 2
G
H
C

CN4	
AUDIO MONITORING OUT	1
AUDIO GND	2

CN1	
MIC IN ⊕	1
MIC IN ⊖	2
AUDIO GND	3
	4

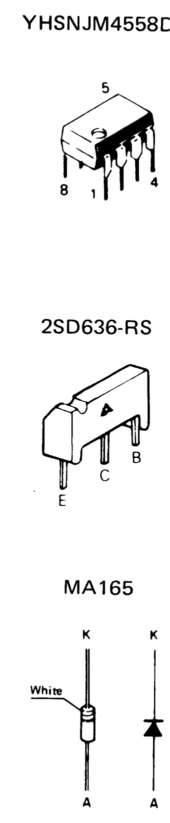

MIC BOARD (YFVPKP77715)
R16 1K
R15 3.3K
R17 2.7K
R19 33K
R27 470
R26 1K
R21 100K
R20 100K
R18 33K
R14 33K
R13 3.3K
R12 3.3K
R10 10K
R11 10K
R25 4.7K
R24 100
R22 33K
R23 47K
R9 620
R4 620
R7 1K
R8 1K
R1 620
R3 100K
R2 100K
R5 100K
R6 100K
C20 47μF 10V
C12 47μF 10V
C14 100PF
C11 10μF 16V
C17 680PF
C15 10μF 16V
C13 100PF
C18 47μF 10V
C16 680PF
C9 10μF 16V
C19 47μF 10V
C10 680PF
C8 10μF 16V
C6 680PF
C4 100PF
C5 100PF
C7 680PF
C3 10μF 16V
C2 10μF 16V
C1 10μF 16V
IC1
IC2
Q001
D1
D2
SW1
SW2
CN1
CN2
CN3
CN4
N
CWK-
108X
APTTO
DRPA

CN22	
2	
1	+9V IN

SW2
MONITORING
SELECTOR

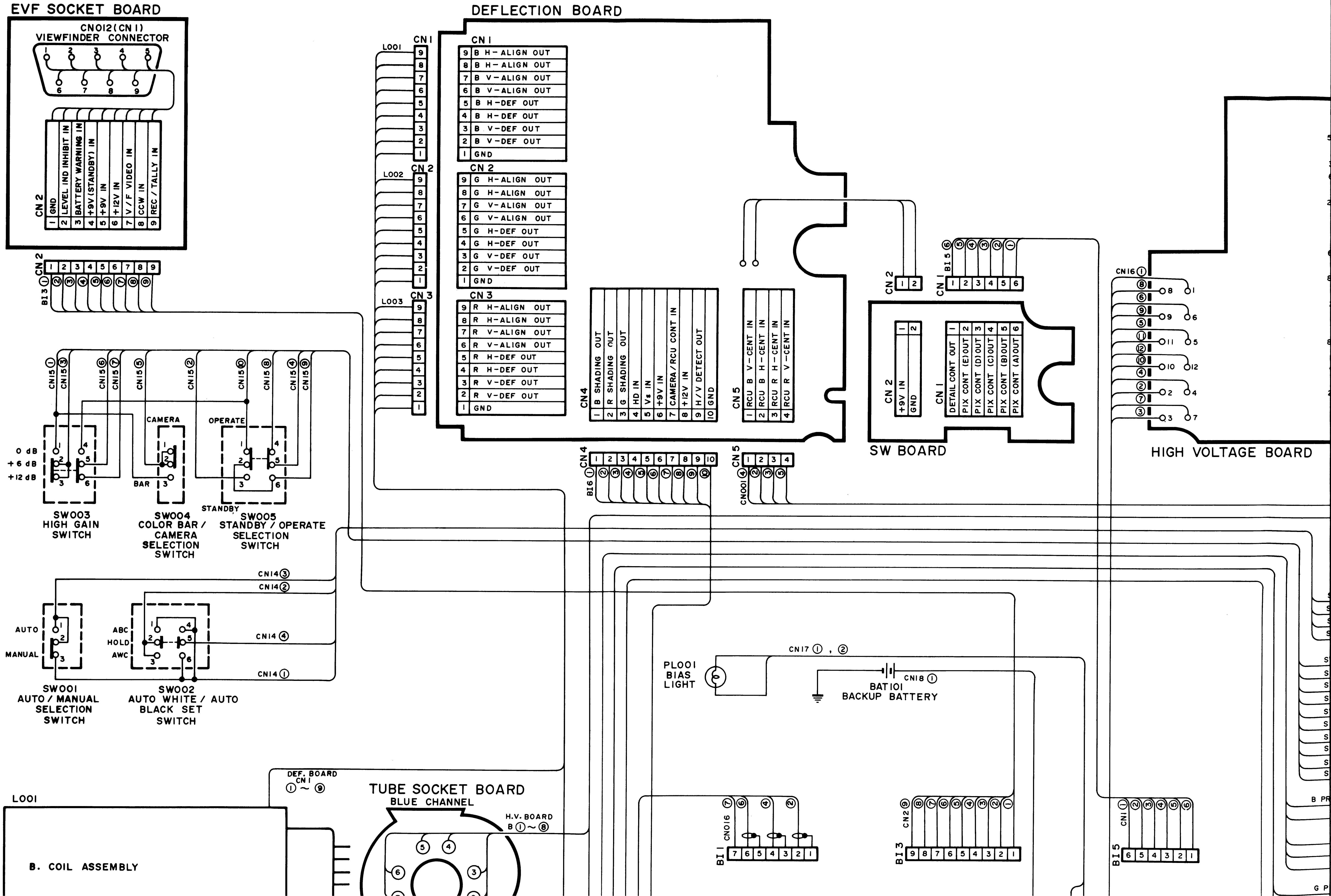
SW1
INPUT
SELECTOR

CN3	
5	AUDIO GND
4	PLAYBACK AUDIO IN
3	AUDIO GND
2	AUDIO OUT ⊖
1	AUDIO OUT ⊕

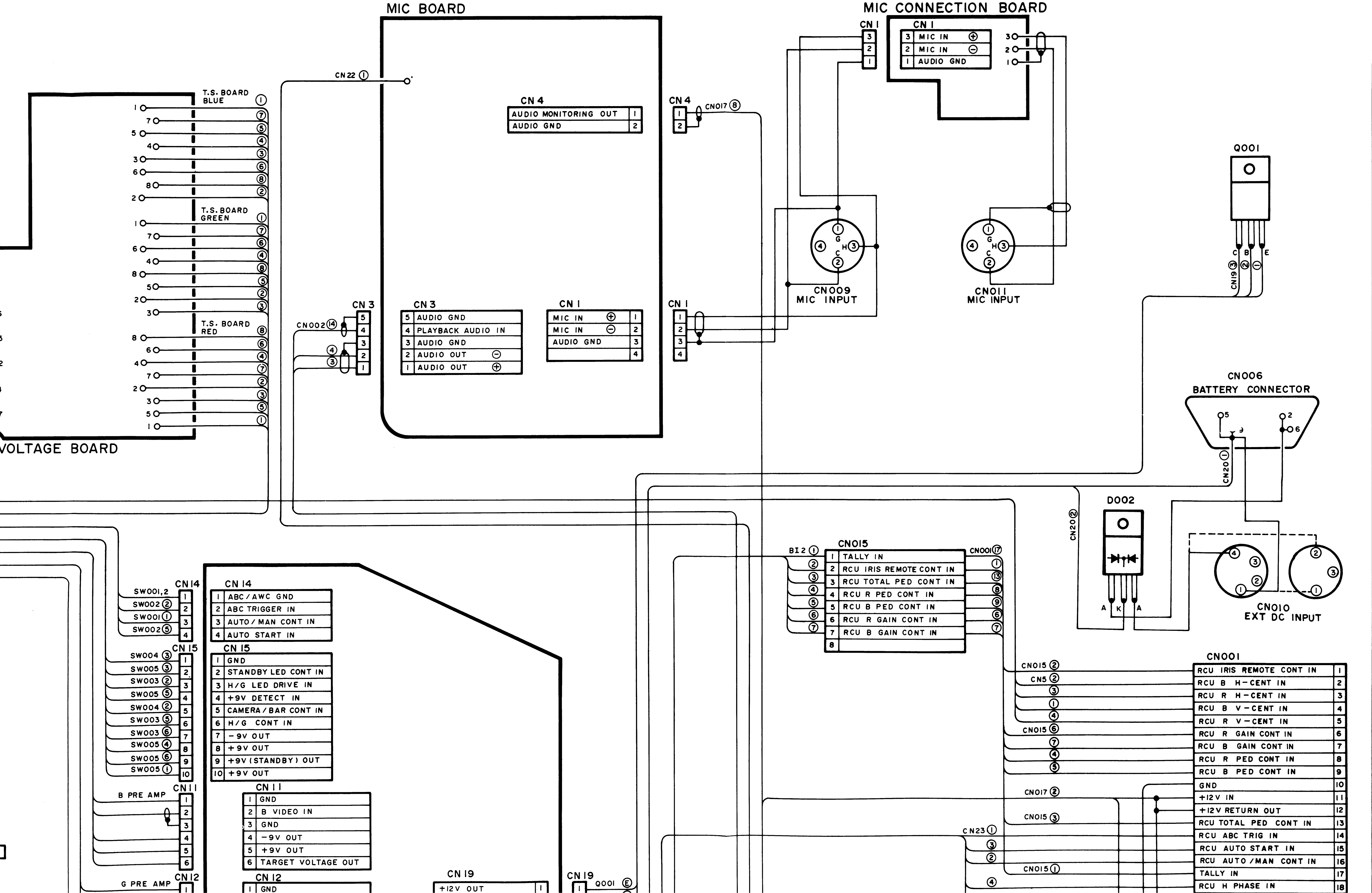

YHSNJM4558D
5
8
1
4
2SD636-RS
E
C
B
MA165
K
White
A

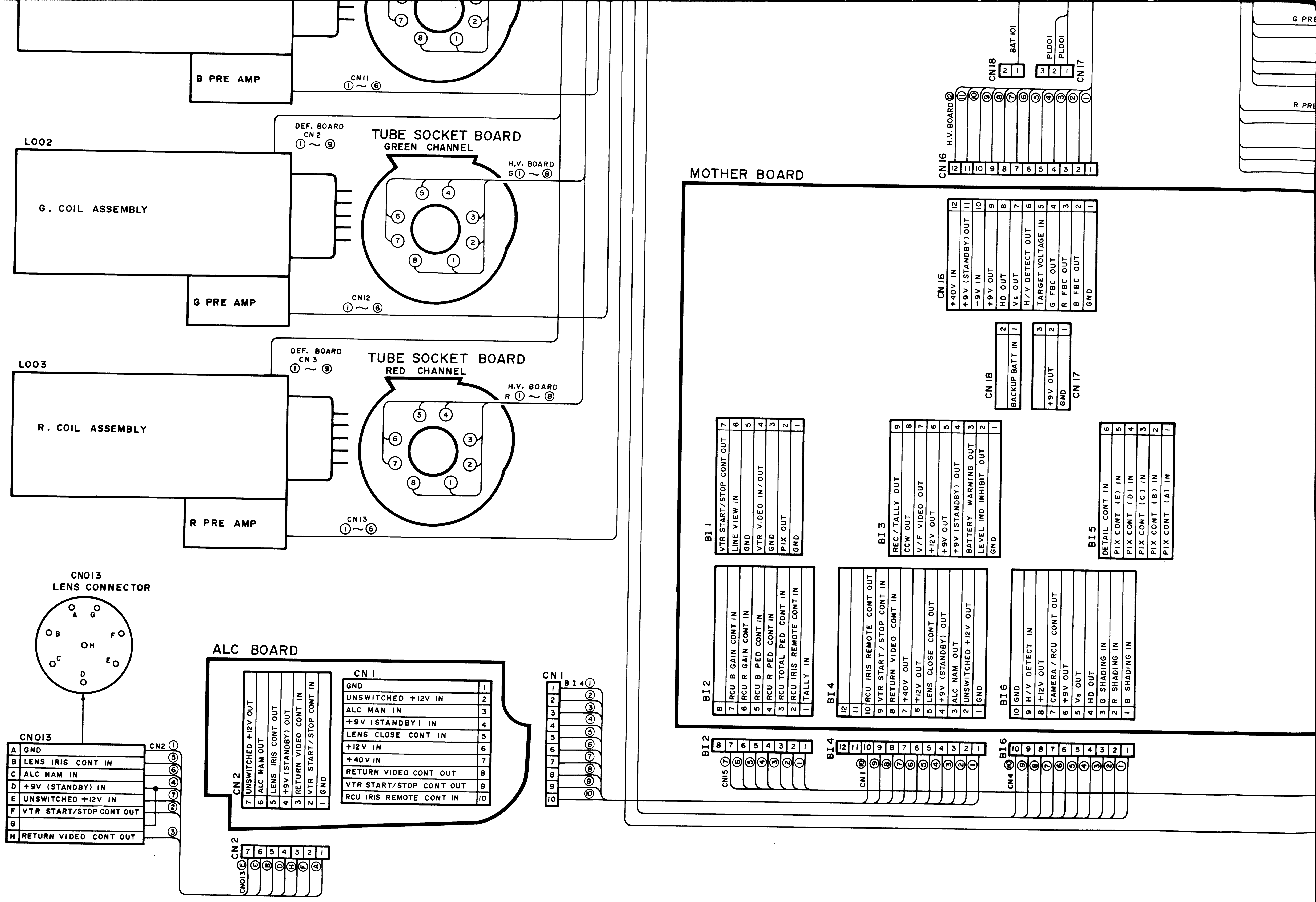
IC1	YHSNJM4558D	A3	Q1	2SD636-RS	A3	D1	MA165	A3
IC2	YHSNJM4558D	B3				D2	MA165	A3

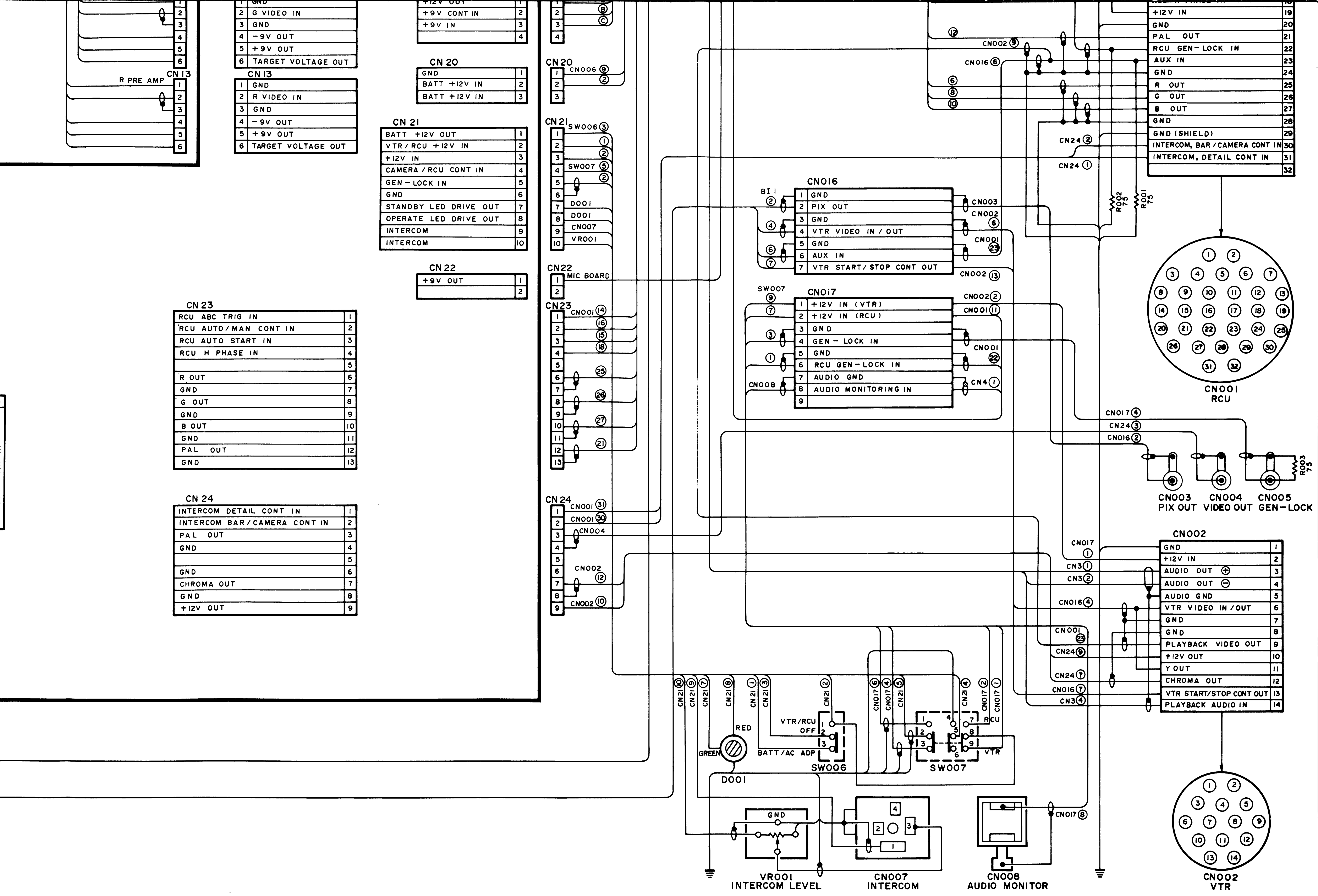
WIRING DIAGR


EVF SOCKET BOARD
CN012(CN1)
VIEWFINDER CONNECTOR
CN 2
1 GND
2 LEVEL IND INHIBIT IN
3 BATTERY WARNING IN
4 +9V (STANDBY) IN
5 +9V IN
6 +12V IN
7 V/F VIDEO IN
8 CCW IN
9 REC / TALLY IN
BI3
DEFLECTION BOARD
L001
L002
L003
CN1
9 B H-ALIGN OUT
8 B H-ALIGN OUT
7 B V-ALIGN OUT
6 B V-ALIGN OUT
5 B H-DEF OUT
4 B H-DEF OUT
3 B V-DEF OUT
2 B V-DEF OUT
1 GND
CN 2
9 G H-ALIGN OUT
8 G H-ALIGN OUT
7 G V-ALIGN OUT
6 G V-ALIGN OUT
5 G H-DEF OUT
4 G H-DEF OUT
3 G V-DEF OUT
2 G V-DEF OUT
1 GND
CN 3
9 R H-ALIGN OUT
8 R H-ALIGN OUT
7 R V-ALIGN OUT
6 R V-ALIGN OUT
5 R H-DEF OUT
4 R H-DEF OUT
3 R V-DEF OUT
2 R V-DEF OUT
1 GND
CN4
1 B SHADING OUT
2 R SHADING OUT
3 G SHADING OUT
4 HD IN
5 Vs IN
6 +9V IN
7 CAMERA/RCU CONT IN
8 +12V IN
9 H/V DETECT OUT
10 GND
CN5
1 RCU B V-CENT IN
2 RCU B H-CENT IN
3 RCU R H-CENT IN
4 RCU R V-CENT IN
BI6
CN001
SW BOARD
CN 2
1 +9V IN
2 GND
CN 1
1 DETAIL CONT OUT
2 PIX CONT (E) OUT
3 PIX CONT (D) OUT
4 PIX CONT (C) OUT
5 PIX CONT (B) OUT
6 PIX CONT (A) OUT
BI5
HIGH VOLTAGE BOARD
CN16
CN15
CAMERA
OPERATE
0 dB
+6 dB
+12 dB
BAR
STANDBY
SW003 HIGH GAIN SWITCH
SW004 COLOR BAR / CAMERA SELECTION SWITCH
SW005 STANDBY / OPERATE SELECTION SWITCH
CN14 ③
CN14 ②
CN14 ④
CN14 ①
AUTO
MANUAL
ABC
HOLD
AWC
SW001 AUTO / MANUAL SELECTION SWITCH
SW002 AUTO WHITE / AUTO BLACK SET SWITCH
PL001 BIAS LIGHT
CN17 ①, ②
CN18 ①
BAT101 BACKUP BATTERY
DEF. BOARD CN1 ① ~ ⑨
TUBE SOCKET BOARD
BLUE CHANNEL
H.V. BOARD B ① ~ ⑧
L001
B. COIL ASSEMBLY
CN016
BI1
CN2
BI3
CN1
BI5
B PR
G PR

NG DIAGRAM


MIC BOARD
MIC CONNECTION BOARD
CN 1
3 MIC IN ⊕
2 MIC IN ⊖
1 AUDIO GND
CN22 ①
CN 4
AUDIO MONITORING OUT 1
AUDIO GND 2
CN 4
CN017 ⑧
T.S. BOARD BLUE
T.S. BOARD GREEN
T.S. BOARD RED
VOLTAGE BOARD
CN 3
CN002 ⑭
CN 3
5 AUDIO GND
4 PLAYBACK AUDIO IN
3 AUDIO GND
2 AUDIO OUT ⊖
1 AUDIO OUT ⊕
CN 1
MIC IN ⊕ 1
MIC IN ⊖ 2
AUDIO GND 3
4
CN 1
CN009 MIC INPUT
CN011 MIC INPUT
G H C
Q001
C B E
CN19 ③ ② ⊖
CN006 BATTERY CONNECTOR
CN20 ⊖
CN20 ②
D002
A K A
CN010 EXT DC INPUT
CN015
BI2 ①
CN001 ⑰
1 TALLY IN
2 RCU IRIS REMOTE CONT IN
3 RCU TOTAL PED CONT IN
4 RCU R PED CONT IN
5 RCU B PED CONT IN
6 RCU R GAIN CONT IN
7 RCU B GAIN CONT IN
8
SW001,2
SW002 ②
SW001 ①
SW002 ⑤
CN14
CN 14
1 ABC/AWC GND
2 ABC TRIGGER IN
3 AUTO/MAN CONT IN
4 AUTO START IN
SW004 ③
SW005 ③
SW003 ②
SW005 ⑤
SW004 ②
SW003 ⑤
SW003 ⑥
SW005 ④
SW005 ⑥
SW005 ①
CN 15
1 GND
2 STANDBY LED CONT IN
3 H/G LED DRIVE IN
4 +9V DETECT IN
5 CAMERA/BAR CONT IN
6 H/G CONT IN
7 -9V OUT
8 +9V OUT
9 +9V (STANDBY) OUT
10 +9V OUT
B PRE AMP
CN11
CN 11
1 GND
2 B VIDEO IN
3 GND
4 -9V OUT
5 +9V OUT
6 TARGET VOLTAGE OUT
G PRE AMP
CN12
CN 12
1 GND
CN 19
+12V OUT 1
CN 19
Q001 Ⓔ
CN015 ②
CN5 ②
CN015 ⑥
CN017 ②
CN015 ③
CN23 ①
CN015 ①
CN001
RCU IRIS REMOTE CONT IN 1
RCU B H-CENT IN 2
RCU R H-CENT IN 3
RCU B V-CENT IN 4
RCU R V-CENT IN 5
RCU R GAIN CONT IN 6
RCU B GAIN CONT IN 7
RCU R PED CONT IN 8
RCU B PED CONT IN 9
GND 10
+12V IN 11
+12V RETURN OUT 12
RCU TOTAL PED CONT IN 13
RCU ABC TRIG IN 14
RCU AUTO START IN 15
RCU AUTO/MAN CONT IN 16
TALLY IN 17
RCU H PHASE IN 18


B PRE AMP
CN11 ①～⑥
DEF. BOARD CN 2 ①～⑨
TUBE SOCKET BOARD
GREEN CHANNEL
H.V. BOARD G①～⑧
L002
G. COIL ASSEMBLY
G PRE AMP
CN12 ①～⑥
L003
DEF. BOARD CN 3 ①～⑨
TUBE SOCKET BOARD
RED CHANNEL
H.V. BOARD R①～⑧
R. COIL ASSEMBLY
R PRE AMP
CN13 ①～⑥
CN013
LENS CONNECTOR
A G B F H C E D
CN013
A GND
B LENS IRIS CONT IN
C ALC NAM IN
D +9V (STANDBY) IN
E UNSWITCHED +12V IN
F VTR START/STOP CONT OUT
G
H RETURN VIDEO CONT OUT
CN2 ① ⑤ ⑥ ④ ⑦ ② ③
ALC BOARD
CN2
7 UNSWITCHED +12V OUT
6 ALC NAM OUT
5 LENS IRIS CONT OUT
4 +9V (STANDBY) OUT
3 RETURN VIDEO CONT IN
2 VTR START/STOP CONT IN
1 GND
CN 1
GND 1
UNSWITCHED +12V IN 2
ALC MAN IN 3
+9V (STANDBY) IN 4
LENS CLOSE CONT IN 5
+12V IN 6
+40V IN 7
RETURN VIDEO CONT OUT 8
VTR START/STOP CONT OUT 9
RCU IRIS REMOTE CONT IN 10
CN 1 1 2 3 4 5 6 7 8 9 10
BI4 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
CN 2 7 6 5 4 3 2 1
CN013 Ⓔ Ⓒ Ⓑ Ⓓ Ⓗ Ⓕ Ⓐ
G PRE
R PRE
CN18 2 1
BAT 101
PL001
PL001
3 2 1 CN17
H.V. BOARD ⑫ ⑪ ⑩ ⑨ ⑧ ⑦ ⑥ ⑤ ④ ③ ② ①
CN16 12 11 10 9 8 7 6 5 4 3 2 1
MOTHER BOARD
CN16
12 +40V IN
11 +9V (STANDBY) OUT
10 −9V IN
9 +9V OUT
8 HD OUT
7 Vs OUT
6 H/V DETECT OUT
5 TARGET VOLTAGE IN
4 G FBC OUT
3 R FBC OUT
2 B FBC OUT
1 GND
CN18
2 BACKUP BATT IN
1
CN17
3
2 +9V OUT
1 GND
BI 1
7 VTR START/STOP CONT OUT
6 LINE VIEW IN
5 GND
4 VTR VIDEO IN/OUT
3 GND
2 PIX OUT
1 GND
BI 3
9 REC/TALLY OUT
8 CCW OUT
7 V/F VIDEO OUT
6 +12V OUT
5 +9V OUT
4 +9V (STANDBY) OUT
3 BATTERY WARNING OUT
2 LEVEL IND INHIBIT OUT
1 GND
BI 5
6 DETAIL CONT IN
5 PIX CONT (E) IN
4 PIX CONT (D) IN
3 PIX CONT (C) IN
2 PIX CONT (B) IN
1 PIX CONT (A) IN
BI 2
8
7 RCU B GAIN CONT IN
6 RCU R GAIN CONT IN
5 RCU B PED CONT IN
4 RCU R PED CONT IN
3 RCU TOTAL PED CONT IN
2 RCU IRIS REMOTE CONT IN
1 TALLY IN
BI 4
12
11
10 RCU IRIS REMOTE CONT OUT
9 VTR START / STOP CONT IN
8 RETURN VIDEO CONT IN
7 +40V OUT
6 +12V OUT
5 LENS CLOSE CONT OUT
4 +9V (STANDBY) OUT
3 ALC NAM OUT
2 UNSWITCHED +12V OUT
1 GND
BI 6
10 GND
9 H/V DETECT IN
8 +12V OUT
7 CAMERA / RCU CONT OUT
6 +9V OUT
5 Vs OUT
4 HD OUT
3 G SHADING IN
2 R SHADING IN
1 B SHADING IN
BI 2 8 7 6 5 4 3 2 1
CN15 ⑦ ⑥ ⑤ ④ ③ ② ①
BI 4 12 11 10 9 8 7 6 5 4 3 2 1
CN 1 ⑩ ⑨ ⑧ ⑦ ⑥ ⑤ ④ ③ ② ①
BI 6 10 9 8 7 6 5 4 3 2 1
CN4 ⑩ ⑨ ⑧ ⑦ ⑥ ⑤ ④ ③ ② ①



R PRE AMP
CN 13
CN 20
CN 21
SW006 ③
SW007 ⑤
D001
CN007
VR001
CN 22
MIC BOARD
CN 23
CN 24
CN004
BI 1
SW007
CN008
CN003
CN002
CN001
CN4 ①
CN017 ④
CN24 ③
CN016 ②
R002 75
R001 75
R003 75
CN003 PIX OUT
CN004 VIDEO OUT
CN005 GEN-LOCK
CN001 RCU
CN3 ①
CN3 ②
CN016 ④
CN24 ⑨
CN24 ⑦
CN016 ⑦
CN3 ④
VTR/RCU
OFF
BATT/AC ADP
SW006
RED
GREEN
D001
RCU
VTR
SW007
GND
VR001 INTERCOM LEVEL
CN007 INTERCOM
CN017 ⑧
CN008 AUDIO MONITOR
CN002 VTR

1	GND
2	G VIDEO IN
3	GND
4	−9V OUT
5	+9V OUT
6	TARGET VOLTAGE OUT

CN 13

1	GND
2	R VIDEO IN
3	GND
4	−9V OUT
5	+9V OUT
6	TARGET VOLTAGE OUT

+12V OUT	1
+9V CONT IN	2
+9V IN	3
	4

CN 20

GND	1
BATT +12V IN	2
BATT +12V IN	3

CN 21

BATT +12V OUT	1
VTR/RCU +12V IN	2
+12V IN	3
CAMERA/RCU CONT IN	4
GEN−LOCK IN	5
GND	6
STANDBY LED DRIVE OUT	7
OPERATE LED DRIVE OUT	8
INTERCOM	9
INTERCOM	10

CN 22

+9V OUT	1
	2

CN 23

RCU ABC TRIG IN	1
RCU AUTO/MAN CONT IN	2
RCU AUTO START IN	3
RCU H PHASE IN	4
	5
R OUT	6
GND	7
G OUT	8
GND	9
B OUT	10
GND	11
PAL OUT	12
GND	13

CN 24

INTERCOM DETAIL CONT IN	1
INTERCOM BAR/CAMERA CONT IN	2
PAL OUT	3
GND	4
	5
GND	6
CHROMA OUT	7
GND	8
+12V OUT	9

CN016

1	GND
2	PIX OUT
3	GND
4	VTR VIDEO IN/OUT
5	GND
6	AUX IN
7	VTR START/STOP CONT OUT

CN017

1	+12V IN (VTR)
2	+12V IN (RCU)
3	GND
4	GEN − LOCK IN
5	GND
6	RCU GEN−LOCK IN
7	AUDIO GND
8	AUDIO MONITORING IN
9	

+12V IN	19
GND	20
PAL OUT	21
RCU GEN−LOCK IN	22
AUX IN	23
GND	24
R OUT	25
G OUT	26
B OUT	27
GND	28
GND (SHIELD)	29
INTERCOM, BAR/CAMERA CONT IN	30
INTERCOM, DETAIL CONT IN	31
	32

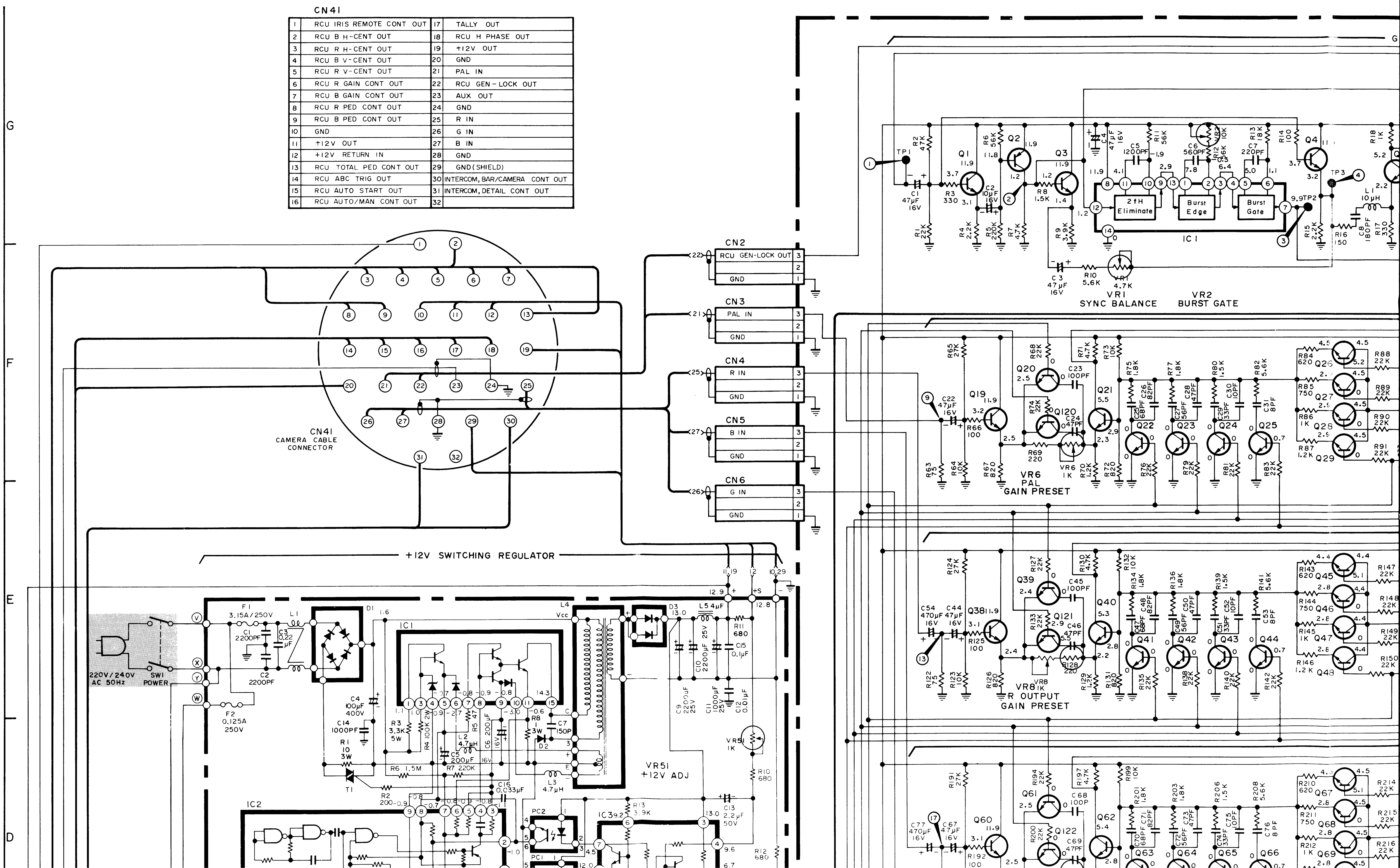
CN002

GND	1
+12V IN	2
AUDIO OUT ⊕	3
AUDIO OUT ⊖	4
AUDIO GND	5
VTR VIDEO IN/OUT	6
GND	7
GND	8
PLAYBACK VIDEO OUT	9
+12V OUT	10
Y OUT	11
CHROMA OUT	12
VTR START/STOP CONT OUT	13
PLAYBACK AUDIO IN	14

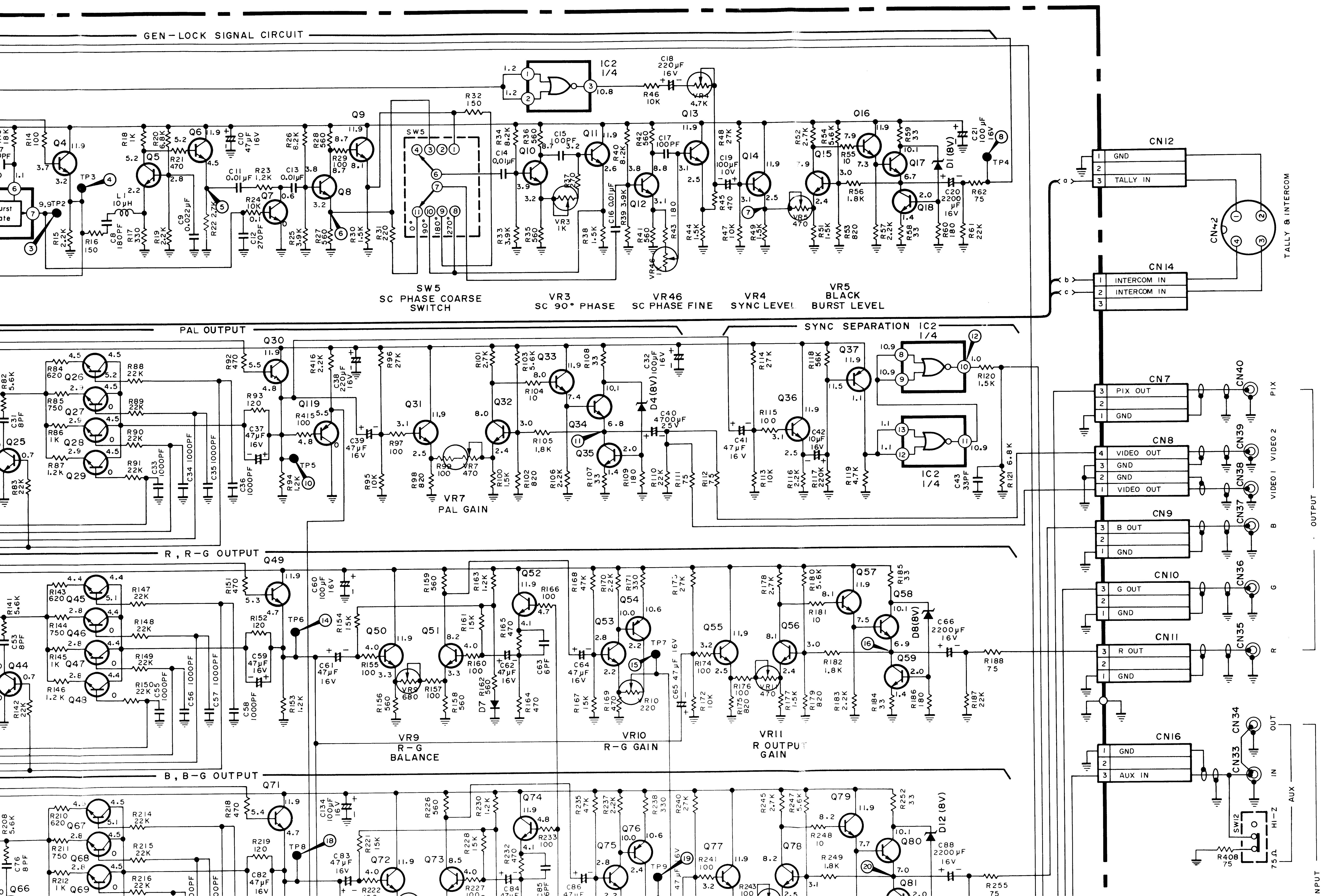
SCHEMATIC DIAGRAM OF REMO

CN41

1	RCU IRIS REMOTE CONT OUT	17	TALLY OUT
2	RCU B H-CENT OUT	18	RCU H PHASE OUT
3	RCU R H-CENT OUT	19	+12V OUT
4	RCU B V-CENT OUT	20	GND
5	RCU R V-CENT OUT	21	PAL IN
6	RCU R GAIN CONT OUT	22	RCU GEN-LOCK OUT
7	RCU B GAIN CONT OUT	23	AUX OUT
8	RCU R PED CONT OUT	24	GND
9	RCU B PED CONT OUT	25	R IN
10	GND	26	G IN
11	+12V OUT	27	B IN
12	+12V RETURN IN	28	GND
13	RCU TOTAL PED CONT OUT	29	GND (SHIELD)
14	RCU ABC TRIG OUT	30	INTERCOM, BAR/CAMERA CONT OUT
15	RCU AUTO START OUT	31	INTERCOM, DETAIL CONT OUT
16	RCU AUTO/MAN CONT OUT	32	


G
F
E
D
CN41
CAMERA CABLE
CONNECTOR
CN2
RCU GEN-LOCK OUT
GND
CN3
PAL IN
GND
CN4
R IN
GND
CN5
B IN
GND
CN6
G IN
GND
TP1
TP2
TP3
Q1
Q2
Q3
Q4
IC1
2fH
Eliminate
Burst
Edge
Burst
Gate
VR1
SYNC BALANCE
VR2
BURST GATE
VR6
PAL
GAIN PRESET
VR8
R OUTPUT
GAIN PRESET
Q19
Q20
Q21
Q22
Q23
Q24
Q25
Q26
Q27
Q28
Q29
Q38
Q39
Q40
Q41
Q42
Q43
Q44
Q45
Q46
Q47
Q48
Q60
Q61
Q62
Q63
Q64
Q65
Q66
Q67
Q68
Q69
Q120
Q121
Q122
+12V SWITCHING REGULATOR
220V/240V
AC 50Hz
SW1
POWER
F1
3.15A/250V
F2
0.125A
250V
L1
L2
4.7μH
L3
4.7μH
L4
L5 4μF
D1
D2
D3
T1
IC1
IC2
IC3
PC1
PC2
VR51
1K
VR51
+12V ADJ
C1
2200PF
C2
2200PF
C3
0.22μF
C4
100μF
400V
C14
1000PF
R1
10
3W
R2
200
R3
3.3K
5W
R4
100K 2W
R6 1.5M
R7 220K
R8
3W
C5
200μF
C6
200μF
16V
C7
150P
C9
2200μF
25V
C10
2200μF
25V
C11
1000μF
25V
C12
0.01μF
C13
2.2μF
50V
C15
0.1μF
C16
0.033μF
R10
680
R11
680
R12
680
R13
3.9K

OF REMOTE CONTROL UNIT (RCU) WV-RC30


GEN-LOCK SIGNAL CIRCUIT
SW5
SC PHASE COARSE
SWITCH
VR3
SC 90° PHASE
VR46
SC PHASE FINE
VR4
SYNC LEVEL
VR5
BLACK
BURST LEVEL
PAL OUTPUT
SYNC SEPARATION IC2 1/4
VR7
PAL GAIN
R, R-G OUTPUT
VR9
R-G
BALANCE
VR10
R-G GAIN
VR11
R OUTPUT
GAIN
B, B-G OUTPUT
CN12
GND
TALLY IN
CN42
TALLY & INTERCOM
CN14
INTERCOM IN
INTERCOM IN
CN7
PIX OUT
GND
CN40
PIX
CN8
VIDEO OUT
GND
GND
VIDEO OUT
CN39
VIDEO 2
CN38
VIDEO 1
CN9
B OUT
GND
CN37
B
CN10
G OUT
GND
CN36
G
CN11
R OUT
GND
CN35
R
OUTPUT
CN16
GND
AUX IN
CN34
OUT
CN33
IN
AUX
SW12
HI-Z
75Ω
R408
75
NPUT

IC1	DN-850	G5, G6
IC2	YWHD14001BP	G8, F9, F10 B9, B10
IC3	YWHD14051BP	C7
IC4	YWHD14051BP	C9
IC5	YWHD14011BP	B8, B9
IC6	YWHA17812P	C3
Q1	2SC828-RS	G5
Q2	2SA838-BC	G5
Q3	2SC828-RS	G5
Q4	2SC828-RS	G6
Q5	2SC828-RS	G6
Q6	2SC828-RS	G7
Q7	2SC1216-F	G7
Q8	2SC828-RS	G7
Q9	2SC828-RS	G7
Q10	2SC828-RS	G8
Q11	2SC828-RS	G8
Q12	2SC828-RS	G8
Q13	2SC828-RS	G9
Q14	2SC828-RS	G9
Q15	2SC828-RS	G9
Q16	2SC828-RS	G9
Q17	2SC1317-RS	G9
Q18	2SC1317-RS	G9, G10
Q19	2SC828-RS	F5
Q20	2SC828-RS	F5
Q21	2SC828-RS	F5
Q22	2SC828-RS	F5
Q23	2SC828-RS	F5, F6
Q24	2SC828-RS	F6
Q25	2SC828-RS	F6
Q26	2SC828-RS	F6
Q27	2SC828-RS	F6
Q28	2SC828-RS	F6
Q29	2SC828-RS	F6
Q30	2SC828-RS	F7
Q31	2SC828-RS	F7, F8
Q32	2SC828-RS	F8
Q33	2SC828-RS	F8
Q34	2SC1317-RS	F8
Q35	2SC1317-RS	F8
Q36	2SC828-RS	F9
Q37	2SA838-BC	F9
Q38	2SC828-RS	E5
Q39	2SC828-RS	E5
Q40	2SC828-RS	E5
Q41	2SC828-RS	E5
Q42	2SC828-RS	E5, E6
Q43	2SC828-RS	E6
Q44	2SC828-RS	E6
Q45	2SC828-RS	E6
Q46	2SC828-RS	E6
Q47	2SC828-RS	E6
Q48	2SC828-RS	E6
Q49	2SC828-RS	E7
Q50	2SC828-RS	E7
Q51	2SC828-RS	E7, E8
Q52	2SC828-RS	E8
Q53	2SC828-RS	E8
Q54	2SA564-RS	E8
Q55	2SC828-RS	E9
Q56	2SC828-RS	E9
Q57	2SC828-RS	E9
Q58	2SC1317-RS	E9
Q59	2SC1317-RS	E9
Q60	2SC828-RS	D5
Q61	2SC828-RS	D5
Q62	2SC828-RS	D5
Q63	2SC828-RS	D5
Q64	2SC828-RS	D5, D6
Q65	2SC828-RS	D6
Q66	2SC828-RS	D6
Q67	2SC828-RS	D6
Q68	2SC828-RS	D6
Q69	2SC828-RS	D6
Q70	2SC828-RS	D6
Q71	2SC828-RS	D7
Q72	2SC828-RS	D7
Q73	2SC828-RS	D7, D8
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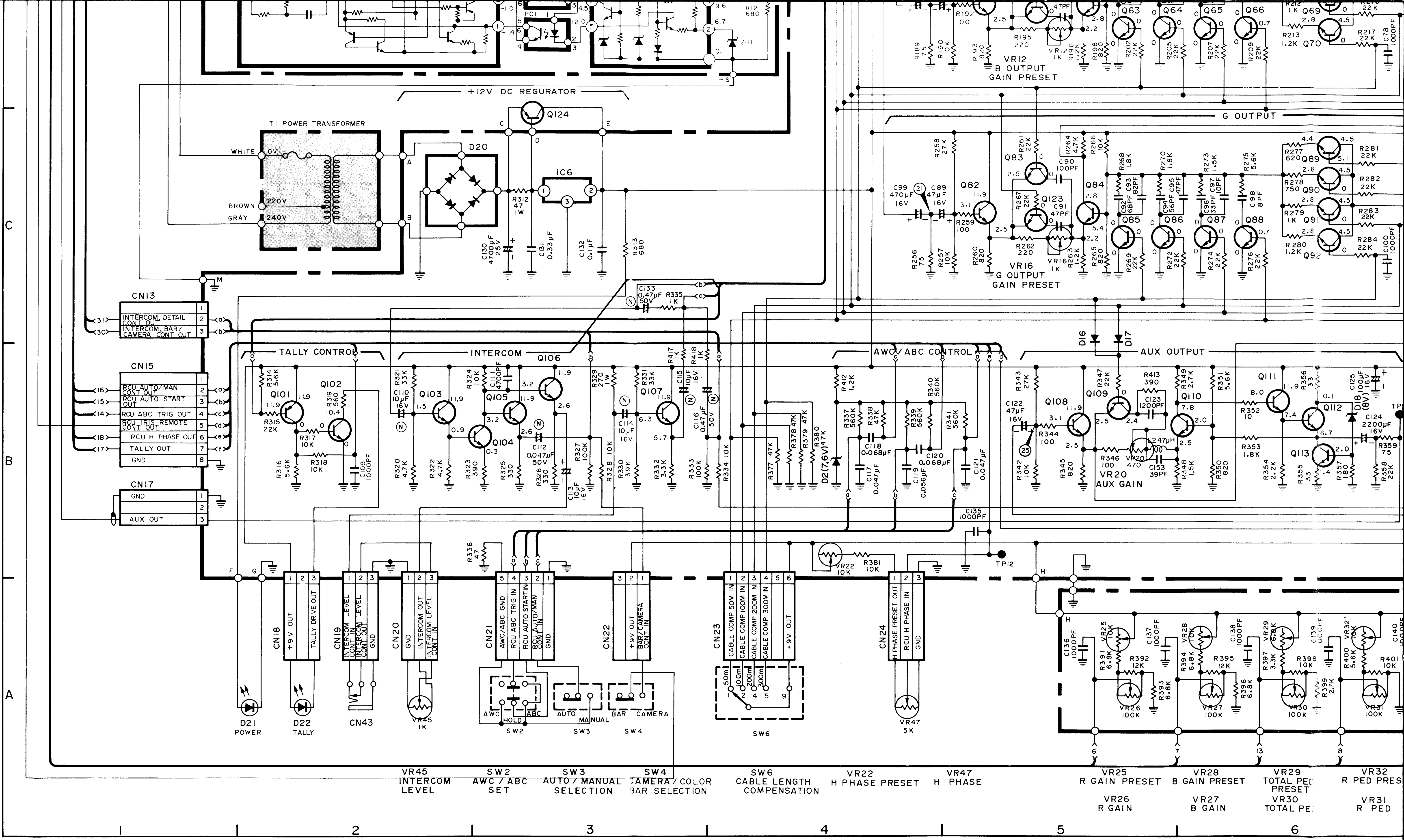
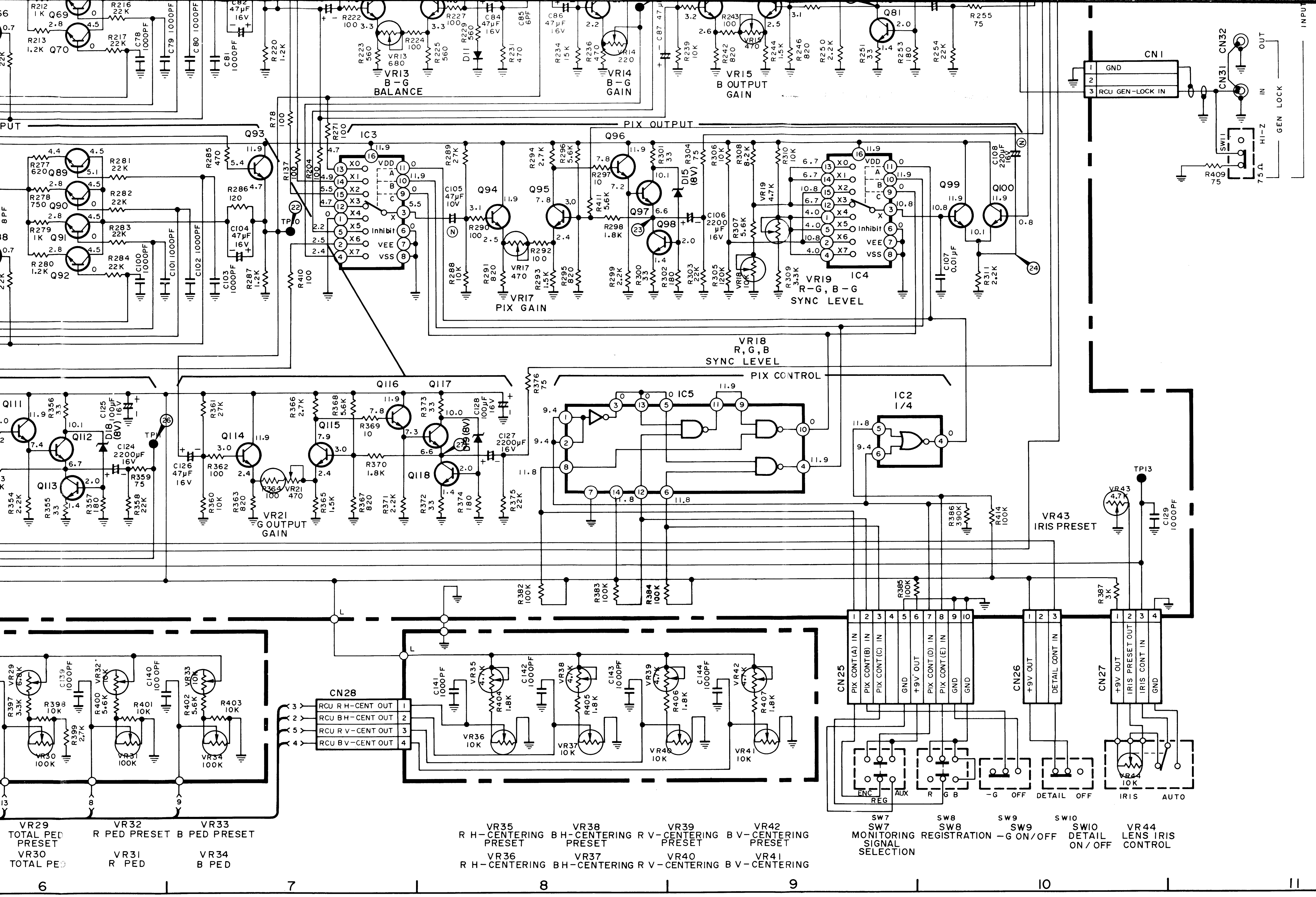
Q75	2SC828-RS	D8
Q76	2SA564-RS	D8
Q77	2SC828-RS	D9


+12V DC REGURATOR
Q124
T1 POWER TRANSFORMER
WHITE 0V
BROWN 220V
GRAY 240V
D20
IC6
R312 47 1W
C130 4700μF 25V
C131 0.33μF
C132 0.1μF
R313 680
CN13
INTERCOM, DETAIL CONT OUT
INTERCOM, BAR/CAMERA CONT OUT
CN15
RCU AUTO/MAN CONT OUT
RCU AUTO START OUT
RCU ABC TRIG OUT
RCU IRIS REMOTE CONT OUT
RCU H PHASE OUT
TALLY OUT
GND
CN17
GND
AUX OUT
TALLY CONTROL
Q101
Q102
INTERCOM
Q103
Q104
Q105
Q106
Q107
AWC / ABC CONTROL
D2(7.6V)
AUX OUTPUT
Q108
Q109
Q110
Q111
Q112
Q113
VR20 AUX GAIN
D16
D17
D18 (8V)
G OUTPUT
Q82
Q83
Q84
Q85
Q86
Q87
Q88
Q89
Q90
Q91
Q92
Q123
VR16 G OUTPUT GAIN PRESET
VR12 B OUTPUT GAIN PRESET
Q63
Q64
Q65
Q66
Q69
Q70
PC1
ZD1
TP12
CN18 +9V OUT TALLY DRIVE OUT
CN19 INTERCOM LEVEL CONT IN INTERCOM LEVEL CONT OUT GND
CN20 GND INTERCOM OUT INTERCOM LEVEL CONT IN
CN21 AWC/ABC GND RCU ABC TRIG IN RCU AUTO START IN RCU AUTO/MAN CONT IN GND
CN22 +9V OUT BAR/CAMERA CONT IN
CN23 CABLE COMP 50M IN CABLE COMP 100M IN CABLE COMP 200M IN CABLE COMP 300M IN +9V OUT
CN24 H PHASE PRESET OUT RCU H PHASE IN GND
CN43
D21 POWER
D22 TALLY
VR45 1K
AWC HOLD ABC SW2
AUTO MANUAL SW3
BAR CAMERA SW4
SW6
VR47 5K
VR22 10K
VR25 VR26 100K
VR28 VR27 100K
VR29 VR30 100K
VR32 VR31 100K
VR45 INTERCOM LEVEL
SW2 AWC / ABC SET
SW3 AUTO / MANUAL SELECTION
SW4 CAMERA / COLOR BAR SELECTION
SW6 CABLE LENGTH COMPENSATION
VR22 H PHASE PRESET
VR47 H PHASE
VR25 R GAIN PRESET
VR26 R GAIN
VR28 B GAIN PRESET
VR27 B GAIN
VR29 TOTAL PED PRESET
VR30 TOTAL PED
VR32 R PED PRESET
VR31 R PED
A
B
C
1
2
3
4
5
6


VR13 B-G BALANCE
VR14 B-G GAIN
VR15 B OUTPUT GAIN
CN1
GND
RCU GEN-LOCK IN
CN32 OUT
CN31 IN
GEN LOCK
HI-Z
75Ω
SW11
INPUT
PIX OUTPUT
IC3
IC4
Q93
Q94
Q95
Q96
Q97
Q98
Q99
Q100
VR17 PIX GAIN
VR19 R-G, B-G SYNC LEVEL
VR18 R,G,B SYNC LEVEL
PIX CONTROL
IC5
IC2 1/4
Q111
Q112
Q113
Q114
Q115
Q116
Q117
Q118
VR21 G OUTPUT GAIN
TP13
VR43 IRIS PRESET
CN28
RCU R H-CENT OUT
RCU B H-CENT OUT
RCU R V-CENT OUT
RCU B V-CENT OUT
CN25
PIX CONT(A) IN
PIX CONT(B) IN
PIX CONT(C) IN
GND
+9V OUT
PIX CONT(D) IN
PIX CONT(E) IN
GND
GND
CN26
+9V OUT
DETAIL CONT IN
CN27
+9V OUT
IRIS PRESET OUT
IRIS CONT IN
GND
ENC
AUX
REG
R
G
B
-G
OFF
DETAIL
OFF
IRIS
AUTO
VR44 10K
VR29 TOTAL PED PRESET
VR30 TOTAL PED
VR32 R PED PRESET
VR31 R PED
VR33 B PED PRESET
VR34 B PED
VR35 R H-CENTERING PRESET
VR36 R H-CENTERING
VR38 B H-CENTERING PRESET
VR37 B H-CENTERING
VR39 R V-CENTERING PRESET
VR40 R V-CENTERING
VR42 B V-CENTERING PRESET
VR41 B V-CENTERING
SW7 MONITORING SIGNAL SELECTION
SW8 REGISTRATION
SW9 -G ON/OFF
SW10 DETAIL ON/OFF
VR44 LENS IRIS CONTROL
6
7
8
9
10
11

Q76	2SA564-RS	D8
Q77	2SC828-RS	D9
Q78	2SC828-RS	D9
Q79	2SC828-RS	D9
Q80	2SC1317-RS	D9
Q81	2SC1317-RS	D9
Q82	2SC828-RS	C5
Q83	2SC828-RS	C5
Q84	2SC828-RS	C5
Q85	2SC828-RS	C5
Q86	2SC828-RS	C5, C6
Q87	2SC828-RS	C6
Q88	2SC828-RS	C6
Q89	2SC828-RS	C6
Q90	2SC828-RS	C6
Q91	2SC828-RS	C6
Q92	2SC828-RS	C6
Q93	2SC828-RS	C7
Q94	2SC828-RS	C8
Q95	2SC828-RS	C8
Q96	2SC828-RS	C8
Q97	2SC1317-RS	C8, C9
Q98	2SC1317-RS	C8, C9
Q99	2SC828-RS	C10
Q100	2SC828-RS	C10
Q101	2SA564-RS	B2
Q102	2SC828-RS	B2
Q103	2SC828-RS	B2
Q104	2SC828-RS	B2, B3
Q105	2SC828-RS	B3
Q106	2SC828-RS	B3
Q107	2SC828-RS	B3
Q108	2SC828-RS	B5
Q109	2SC828-RS	B5
Q110	2SC828-RS	B5, B6
Q111	2SC828-RS	B6
Q112	2SC1317-RS	B6
Q113	2SC1317-RS	B6
Q114	2SC828-RS	B7
Q115	2SC828-RS	B7
Q116	2SC828-RS	B7, B8
Q117	2SC1317-RS	C8
Q118	2SC1317-RS	C8
Q119	2SA838-BC	F7
Q120	2SC828-RS	F5
Q121	2SC828-RS	E5
Q122	2SC828-RS	D5
Q123	2SC828-RS	C5
D1	YUDXZ-080	G10
D2	XZ076	B4
D4	YUDXZ-080	F8
D7	MA150	E8
D8	YUDXZ-080	E9, E10
D11	MA150	D8
D12	YUDXZ-080	D9, D10
D15	YUDXZ-080	C9
D16	MA165	B5, C5
D17	MA165	B5, C5
D18	YUDXZ-080	B6
D19	YUDXZ-080	B8
D20	YWM4C51-13	C2, C3

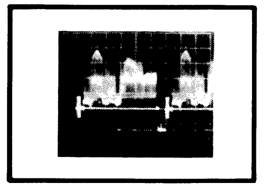
RCU (SWITCHING REGULATOR BOARD)

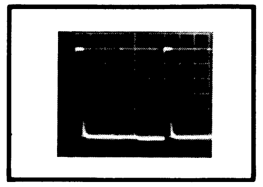
IC1	STK-711P	F7
IC2	STK-752	F7
IC3	STK-761D	F8
PC1	PC714U	F7, F8
PC2	PC714U	F7, F8
T1	TA10E-R	F8
D1	DBA20G	E8, F8
D2	ERC25-08	F7
D3	S5KC20	D7, E7
ZD1	GZA618Y	F8

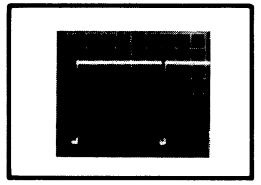
PRODUCT SAFETY NOTE

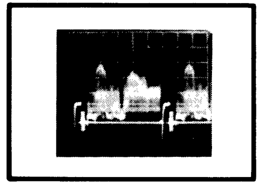
The shaded area on this schematic diagram incorporates special features important for protection from X-Radiation, fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

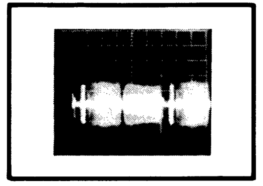
SIGNAL WAVEFORMS OF REMOTE CONTROL UNIT

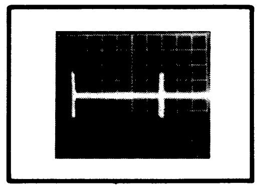
1 0.2V/DIV, 10μs/DIV


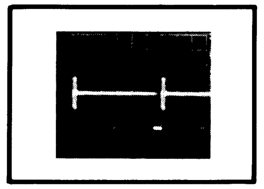
2 2V/DIV, 10μs/DIV


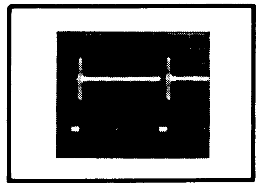
3 2V/DIV, 10μs/DIV


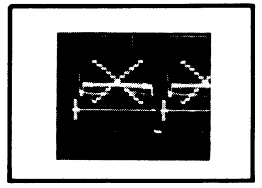
4 0.2V/DIV, 10μs/DIV


5 0.5V/DIV, 10μs/DIV


6 0.2V/DIV, 10μs/[


7 0.2V/DIV, 10μs/DIV


8 0.1V/DIV, 10μs/DIV


9 0.2V/DIV,10μs/DIV


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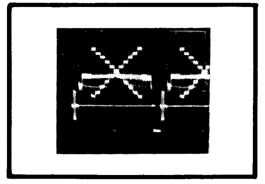
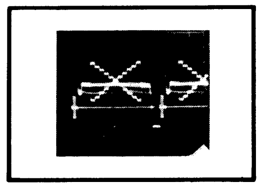
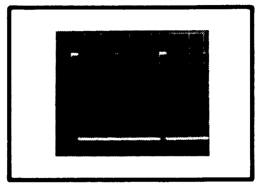
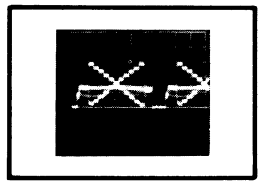


11 0.5V/DIV, 10μs/DIV


12 2V/DIV, 10μs/DIV


13 0.2V/DIV, 10μs/DIV


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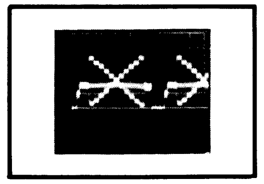

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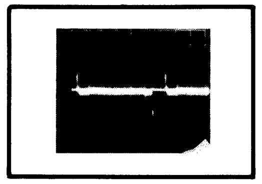

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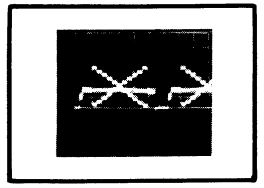

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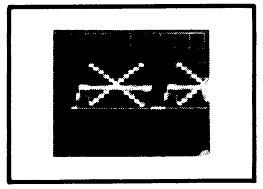

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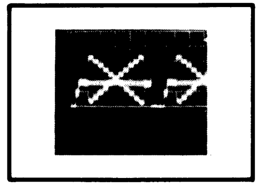

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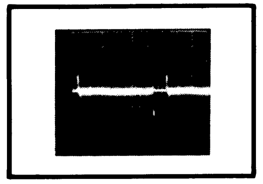

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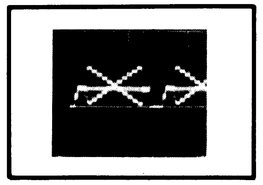

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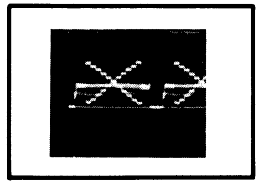

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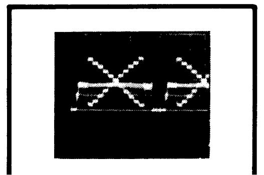

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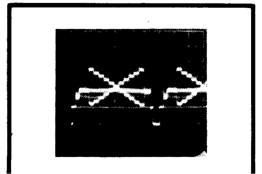
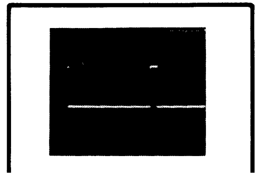


24 1V/DIV, 10μs/DIV


H

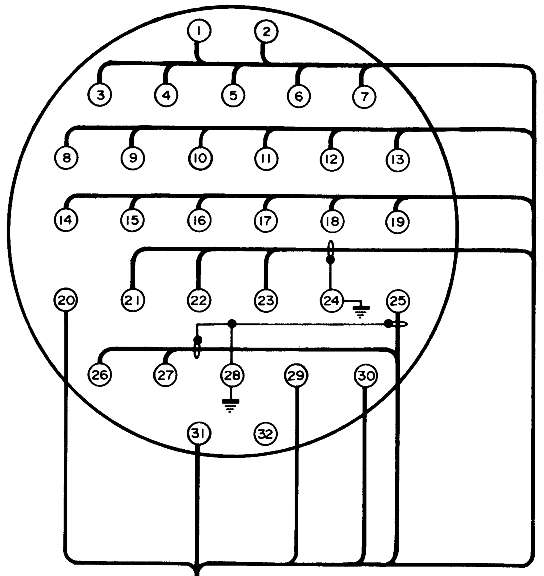
G

F

E

CONDUCTOR VIEW OF REMOTE

CN41
CAMERA CABLE
CONNECTOR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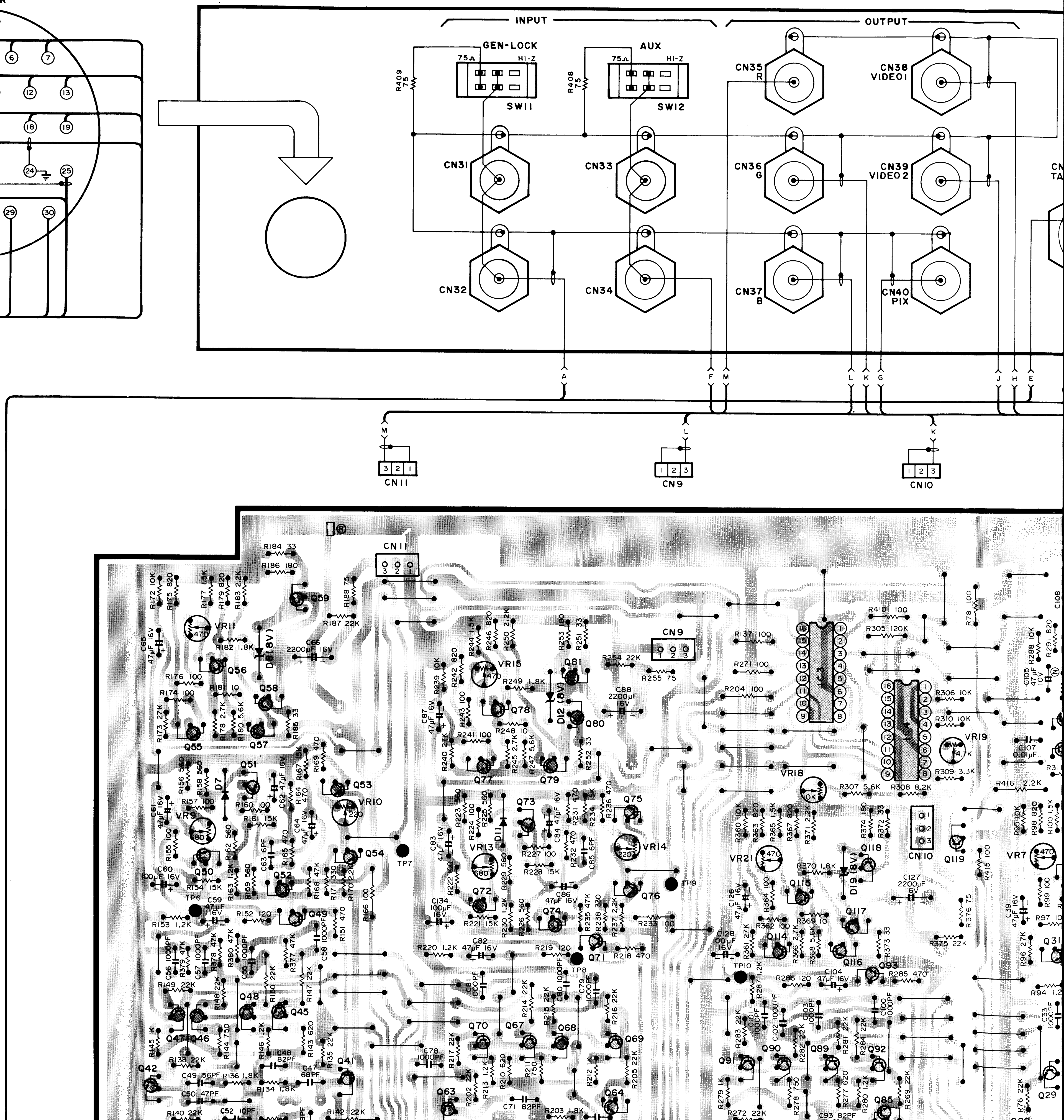

INPUT
OUTPUT
GEN-LOCK
75Ω
Hi-Z
SW11
AUX
75Ω
Hi-Z
SW12
R409 75
R408 75
CN31
CN32
CN33
CN34
CN35 R
CN36 G
CN37 B
CN38 VIDEO1
CN39 VIDEO2
CN40 PIX
A
F
M
L
K
G
J
H
E
CN11
CN9
CN10
VR11
VR9
VR10
VR13
VR14
VR15
VR18
VR19
VR21
VR7
IC3
IC4
TP6
TP7
TP8
TP9
TP10
Q41
Q42
Q45
Q46
Q47
Q48
Q49
Q50
Q51
Q52
Q53
Q54
Q55
Q56
Q57
Q58
Q59
Q63
Q64
Q67
Q68
Q69
Q70
Q71
Q72
Q73
Q74
Q75
Q76
Q77
Q78
Q79
Q80
Q81
Q85
Q89
Q90
Q91
Q92
Q93
Q114
Q115
Q116
Q117
Q118
Q119
D7
D8 (8V)
D11
D12 (8V)
D19 (8V)

VR11
R OUTPUT GAIN

VR10
R-G GAIN

VR9
R-G BALANCE

VR8
R OUTPUT
GAIN PRESET

VR15
B OUTPUT GAIN

VR14
B-G GAIN

VR13
B-G BALANCE

VR12
B OUTPUT GAIN
PRESET

VR43
IRIS PRESET

VR22
H PHASE PRESET

VR19
R-G, B-G
SYNC LEVEL

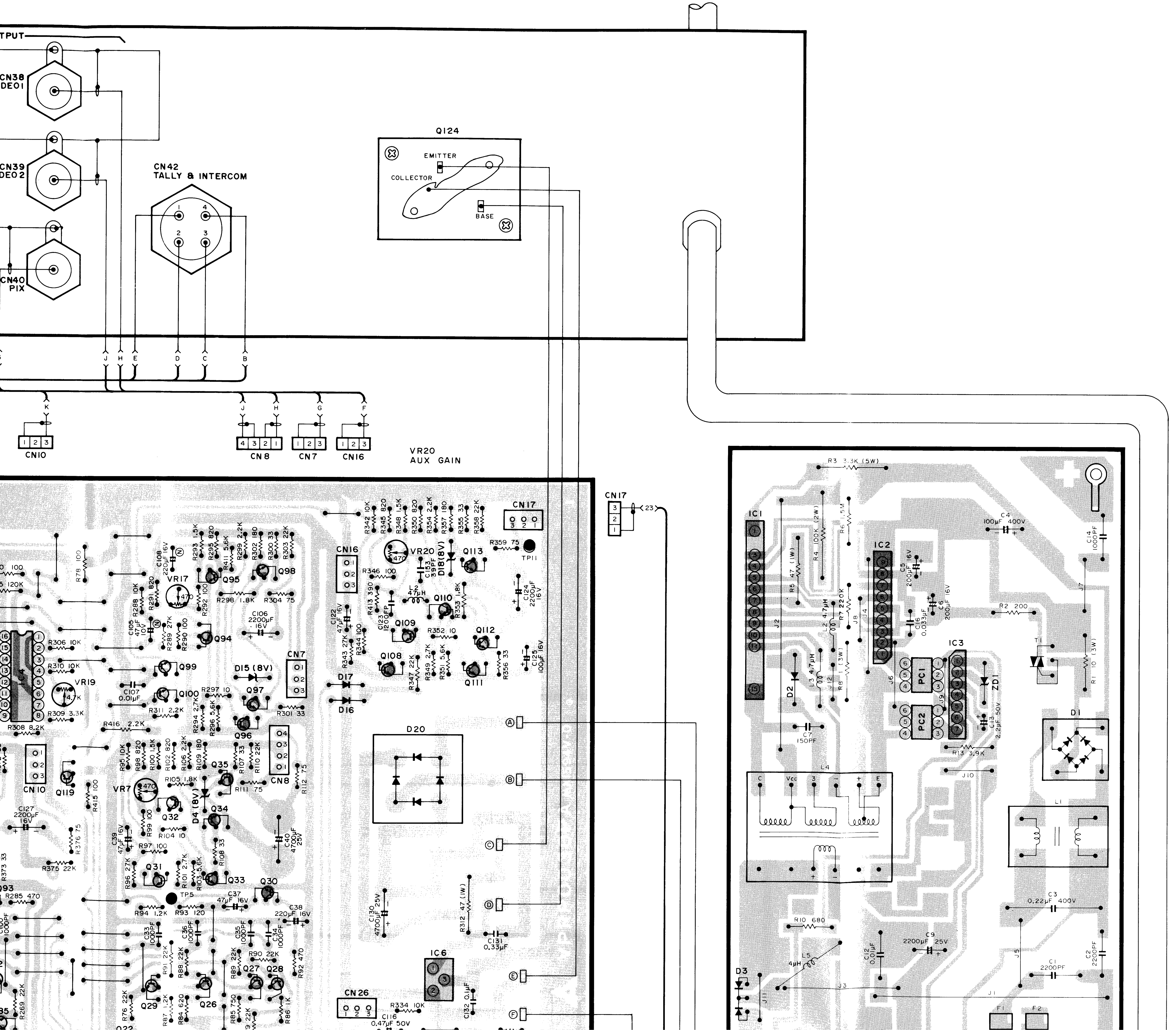
VR18
R, G, B
SYNC LEVEL

VR21
G OUTPUT GAIN

VR16
G OUTPUT GAIN
PRESET

VR17
PIX GAIN

OF REMOTE CONTROL UNIT (RCU) WV-RC30

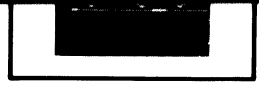

TPUT
CN38
DEO1
CN39
DEO2
CN40
PIX
CN42
TALLY & INTERCOM
Q124
EMITTER
COLLECTOR
BASE
CN10
CN8
CN7
CN16
VR20
AUX GAIN
CN17
TP11
VR17
VR19
VR7
VR20
D15 (8V)
D17
D16
D18(8V)
D4 (8V)
D20
IC6
CN26
TP5
Q94
Q95
Q96
Q97
Q98
Q99
Q100
Q108
Q109
Q110
Q111
Q112
Q113
Q119
Q26
Q27
Q28
Q29
Q30
Q31
Q32
Q33
Q34
Q35
IC1
IC2
IC3
PC1
PC2
ZD1
D1
D2
D3
T1
L1
L4
L5
F1
F2
R3 3.3K (5W)
C4 100μF 400V
C14 1000PF
R2 200
R1 10 (3W)
R13 3.9K
C7 150PF
C3 0.22μF 400V
R10 680
C9 2200μF 25V
C1 2200PF
C2 2200PF
C12 0.01μF
J1
J2
J3
J5
J6
J7
J8
J9
J10
J11
J12

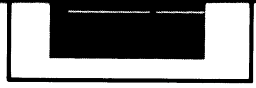
RCU (MAIN BOARD)

IC1	DN-850	C6
IC2	YWHD14001BP	C4, D4
IC3	YWHD14051BP	F4
IC4	YWHD14051BP	F4
IC5	YWHD14011BP	C4, D4
IC6	YWHA17812P	E6
Q1	2SC828-RS	D6
Q2	2SA838-BC	D6
Q3	2SC828-RS	D6
Q4	2SC828-RS	D6
Q5	2SC828-RS	C6, D6
Q6	2SC828-RS	C6
Q7	2SC1216-F	C6
Q8	2SC828-RS	C5, C6
Q9	2SC828-RS	C5
Q10	2SC828-RS	C5
Q11	2SC828-RS	C5
Q12	2SC828-RS	C5
Q13	2SC828-RS	C5
Q14	2SC828-RS	C4
Q15	2SC828-RS	C4
Q16	2SC828-RS	C4
Q17	2SC1317-RS	C4
Q18	2SC1317-RS	C4
Q19	2SC828-RS	D5
Q20	2SC828-RS	D5
Q21	2SC828-RS	D5
Q22	2SC828-RS	D5
Q23	2SC828-RS	D5
Q24	2SC828-RS	D5
Q25	2SC828-RS	D5
Q26	2SC828-RS	E5
Q27	2SC828-RS	E5
Q28	2SC828-RS	E5
Q29	2SC828-RS	E5
Q30	2SC828-RS	E5
Q31	2SC828-RS	E5
Q32	2SC828-RS	E5
Q33	2SC828-RS	E5
Q34	2SC1317-RS	E5
Q35	2SC1317-RS	E5
Q36	2SC828-RS	D5
Q37	2SA838-BC	C5, D5
Q38	2SC828-RS	D2
Q39	2SC828-RS	D2
Q40	2SC828-RS	D2
Q41	2SC828-RS	E2
Q42	2SC828-RS	E2
Q43	2SC828-RS	D2
Q44	2SC828-RS	D2
Q45	2SC828-RS	E2
Q46	2SC828-RS	E2
Q47	2SC828-RS	E2
Q48	2SC828-RS	E2
Q49	2SC828-RS	E2
Q50	2SC828-RS	E2
Q51	2SC828-RS	F2
Q52	2SC828-RS	E2
Q53	2SC828-RS	F2
Q54	2SA564-RS	E2
Q55	2SC828-RS	F2
Q56	2SC828-RS	F2
Q57	2SC828-RS	F2
Q58	2SC1317-RS	F2
Q59	2SC1317-RS	F2
Q60	2SC828-RS	D3
Q61	2SC828-RS	D3
Q62	2SC828-RS	D3
Q63	2SC828-RS	D3, E3
Q64	2SC828-RS	D3, E3
Q65	2SC828-RS	D3
Q66	2SC828-RS	D3
Q67	2SC828-RS	E3
Q68	2SC828-RS	E3

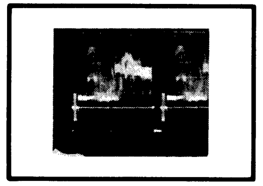
RCU (SWITCHING REGULATOR BOARD)

IC1	STK-711P	E2, E3
IC2	STK-752	D2
IC3	STK-761D	D3, D4
PC1	PC714U	D3
PC2	PC714U	D3
T1	TA10E-R	D2
D1	DBA20G	E2
D2	ERC25-08	D3
D3	S5KC20	E3
ZD1	GZA618Y	D4

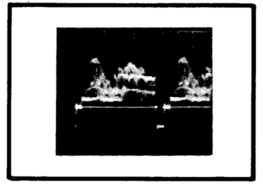




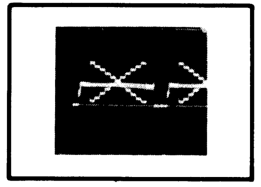
25 0.2V/DIV, 10μs/DIV



26 0.2V/DIV, 10μs/DIV

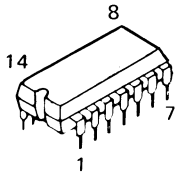


27 0.5V/DIV, 10μs/DIV

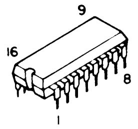


MAIN BOARD

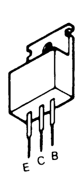
DN-850
YWHD14001BP
YWHD14011BP



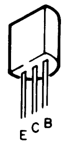
YWHD14051



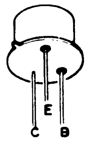
YWHA17812P



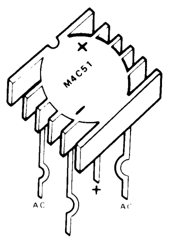
2SA564-RS
2SA838-BC
2SC828-RS
2SC1317-RS



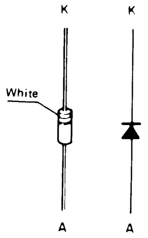
2SC1216-F



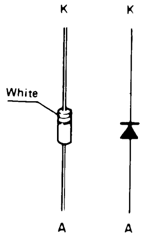
YWM4C51-13



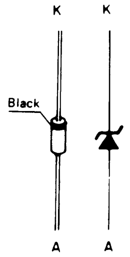
MA165



MA150

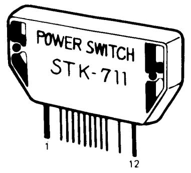


XZ076
YUDXZ-080

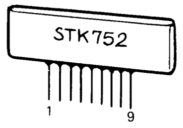


SWITCHING REGULATOR

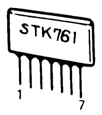
STK-711P


POWER SWITCH
STK-711
1
12

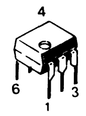
STK-752



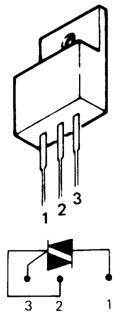
STK-761D



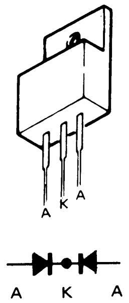
PC714U



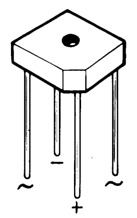
TA10E-R



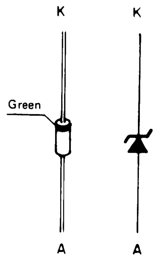
S5KC20



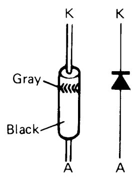
DBA20G

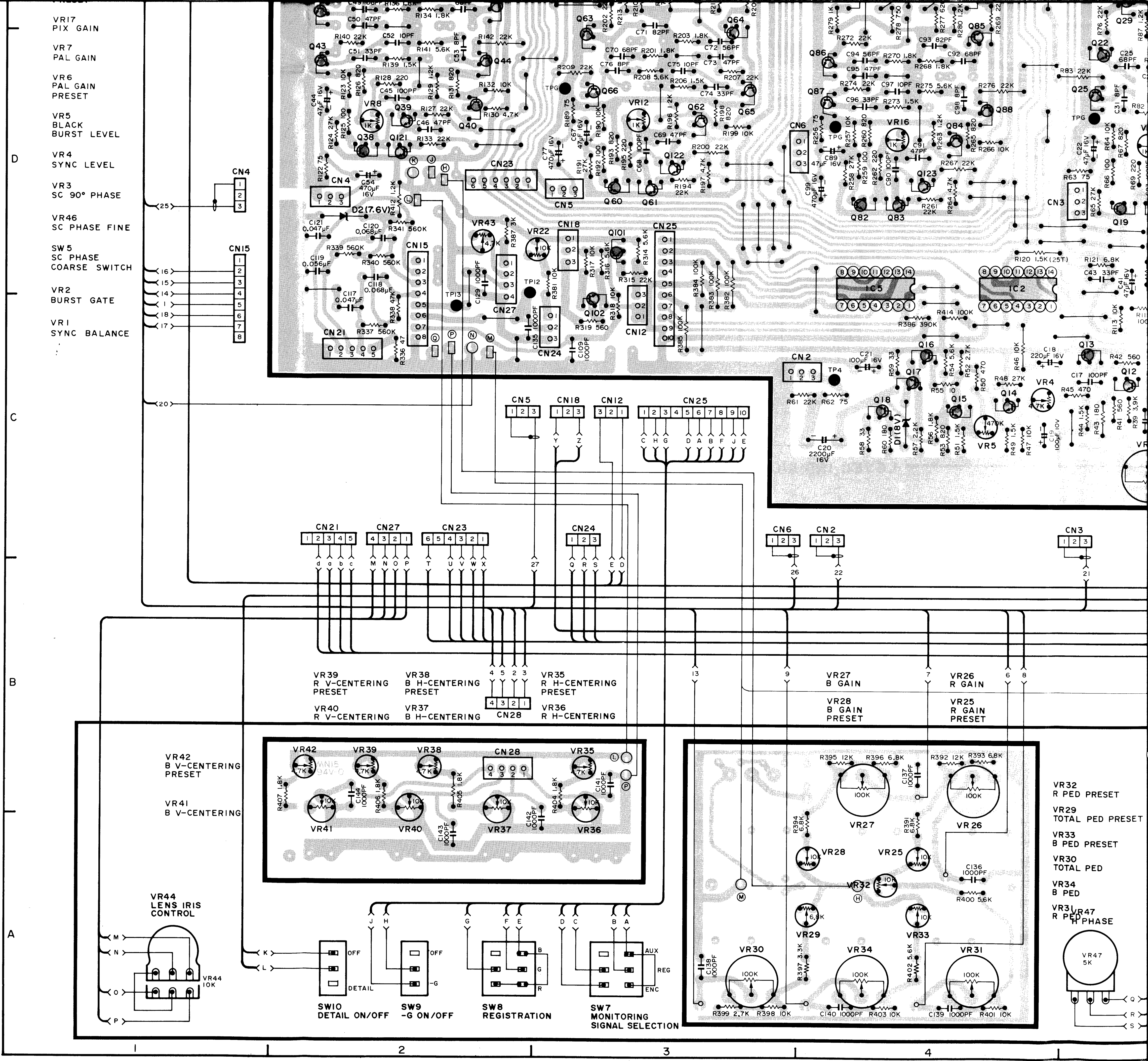


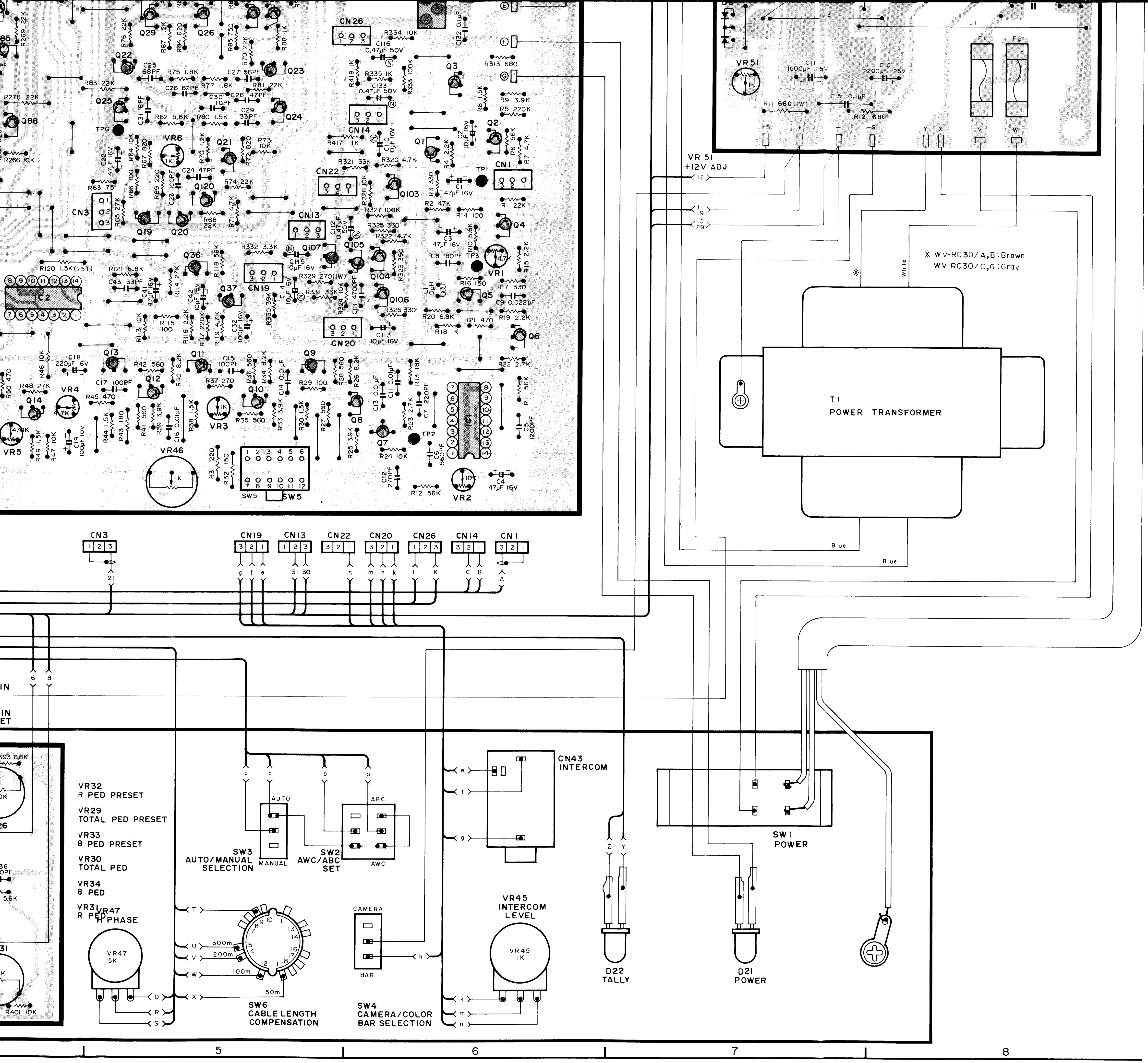
GZA618Y



ERC25-08

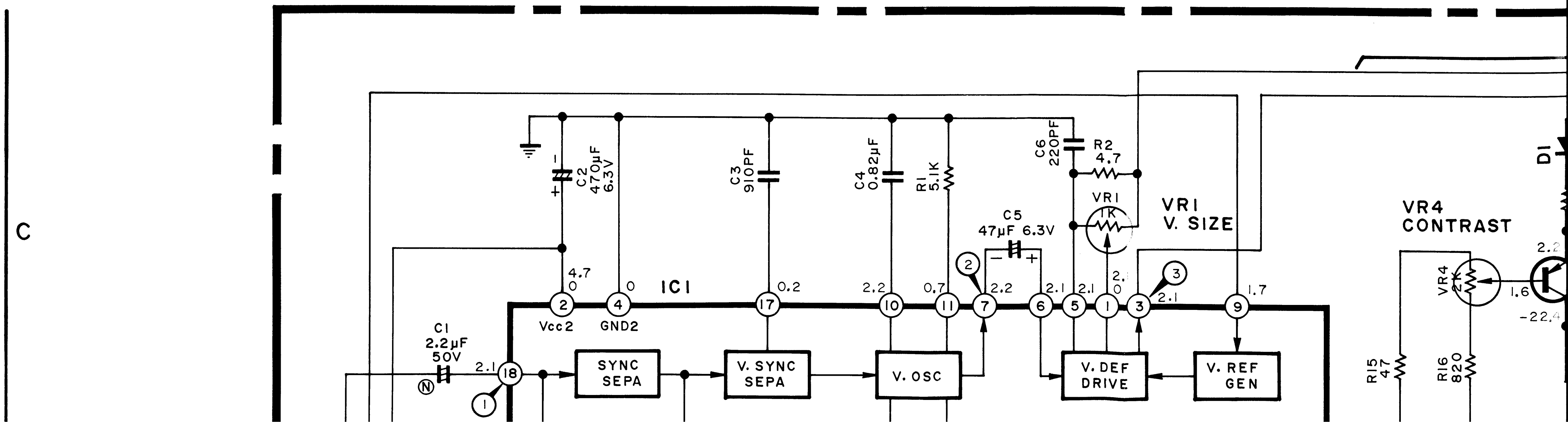

K
K
Gray
Black
A
A


D
C
B
A
1
2
3
4
VR17
PIX GAIN
VR7
PAL GAIN
VR6
PAL GAIN
PRESET
VR5
BLACK
BURST LEVEL
VR4
SYNC LEVEL
VR3
SC 90° PHASE
VR46
SC PHASE FINE
SW5
SC PHASE
COARSE SWITCH
VR2
BURST GATE
VR1
SYNC BALANCE
CN4
CN15
CN5
CN18
CN12
CN25
CN21
CN27
CN23
CN24
CN6
CN2
CN3
CN28
IC5
IC2
VR39
R V-CENTERING
PRESET
VR40
R V-CENTERING
VR38
B H-CENTERING
PRESET
VR37
B H-CENTERING
VR35
R H-CENTERING
PRESET
VR36
R H-CENTERING
VR27
B GAIN
VR28
B GAIN
PRESET
VR26
R GAIN
VR25
R GAIN
PRESET
VR42
B V-CENTERING
PRESET
VR41
B V-CENTERING
VR32
R PED PRESET
VR29
TOTAL PED PRESET
VR33
B PED PRESET
VR30
TOTAL PED
VR34
B PED
VR31
R PED
VR47
H PHASE
VR44
LENS IRIS
CONTROL
SW10
DETAIL ON/OFF
SW9
-G ON/OFF
SW8
REGISTRATION
SW7
MONITORING
SIGNAL SELECTION
OFF
DETAIL
OFF
-G
B
G
R
AUX
REG
ENC


VR51 +12V ADJ
※ WV-RC30/A,B:Brown
WV-RC30/C,G:Gray
White
Blue
T1 POWER TRANSFORMER
CN3
CN19
CN13
CN22
CN20
CN26
CN14
CN1
IC1
IC2
VR32 R PED PRESET
VR29 TOTAL PED PRESET
VR33 B PED PRESET
VR30 TOTAL PED
VR34 B PED
VR31 R PED
VR47 H PHASE
SW3 AUTO/MANUAL SELECTION
AUTO
MANUAL
SW2 AWC/ABC SET
ABC
AWC
CN43 INTERCOM
SW1 POWER
SW6 CABLE LENGTH COMPENSATION
300m
200m
100m
50m
CAMERA
BAR
SW4 CAMERA/COLOR BAR SELECTION
VR45 INTERCOM LEVEL
D22 TALLY
D21 POWER
5
6
7
8

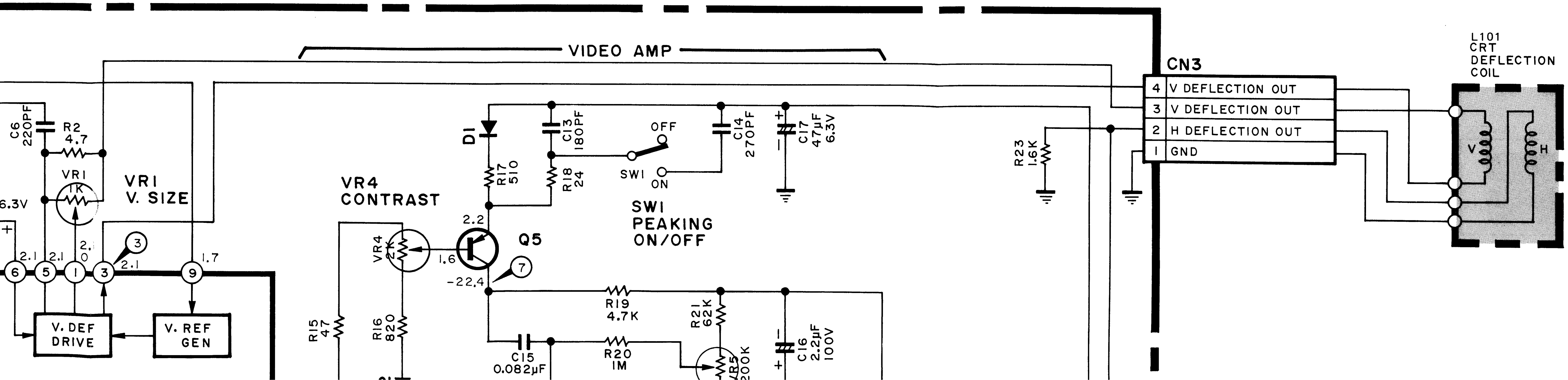
Q64	2SC828-RS	D3, E3
Q65	2SC828-RS	D3
Q66	2SC828-RS	D3
Q67	2SC828-RS	E3
Q68	2SC828-RS	E3
Q69	2SC828-RS	E3
Q70	2SC828-RS	E3
Q71	2SC828-RS	E3
Q72	2SC828-RS	E3
Q73	2SC828-RS	E3, F3
Q74	2SC828-RS	E3
Q75	2SC828-RS	E3, F3
Q76	2SA564-RS	E3
Q77	2SC828-RS	F3
Q78	2SC828-RS	F3
Q79	2SC828-RS	F3
Q80	2SC1317-RS	F3
Q81	2SC1317-RS	F3
Q82	2SC828-RS	D4
Q83	2SC828-RS	D4
Q84	2SC828-RS	D4
Q85	2SC828-RS	D4, E4
Q86	2SC828-RS	D4
Q87	2SC828-RS	D4
Q88	2SC828-RS	D4
Q89	2SC828-RS	E4
Q90	2SC828-RS	E4
Q91	2SC828-RS	E4
Q92	2SC828-RS	E4
Q93	2SC828-RS	E4
Q94	2SC828-RS	F5
Q95	2SC828-RS	F5
Q96	2SC828-RS	F5
Q97	2SC1317-RS	F5
Q98	2SC1317-RS	F5
Q99	2SC828-RS	F5
Q100	2SC828-RS	F5
Q101	2SA564-RS	D3
Q102	2SC828-RS	C3, D3
Q103	2SC828-RS	D6
Q104	2SC828-RS	D6
Q105	2SC828-RS	D5, D6
Q106	2SC828-RS	C6, D6
Q107	2SC828-RS	D5
Q108	2SC828-RS	F6
Q109	2SC828-RS	F6
Q110	2SC828-RS	F6
Q111	2SC828-RS	F6
Q112	2SC1317-RS	F6
Q113	2SC1317-RS	F6
Q114	2SC828-RS	E4
Q115	2SC828-RS	E4
Q116	2SC828-RS	E4
Q117	2SC1317-RS	E4
Q118	2SC1317-RS	E4
Q119	2SA838-BC	E4
Q120	2SC828-RS	D5
Q121	2SC828-RS	D2
Q122	2SC828-RS	D3
Q123	2SC828-RS	D4
D1	YUDXZ-080	C4
D2	XZ076	D2
D4	YUDXZ-080	E5
D7	MA150	E2, F2
D8	YUDXZ-080	F2
D11	MA150	E3, F3
D12	YUDXZ-080	F3
D15	YUDXZ-080	F5
D16	MA165	F5, F6
D17	MA165	F5, F6
D18	YUDXZ-080	F6
D19	YUDXZ-080	E4
D20	YWM4C51-13	E6

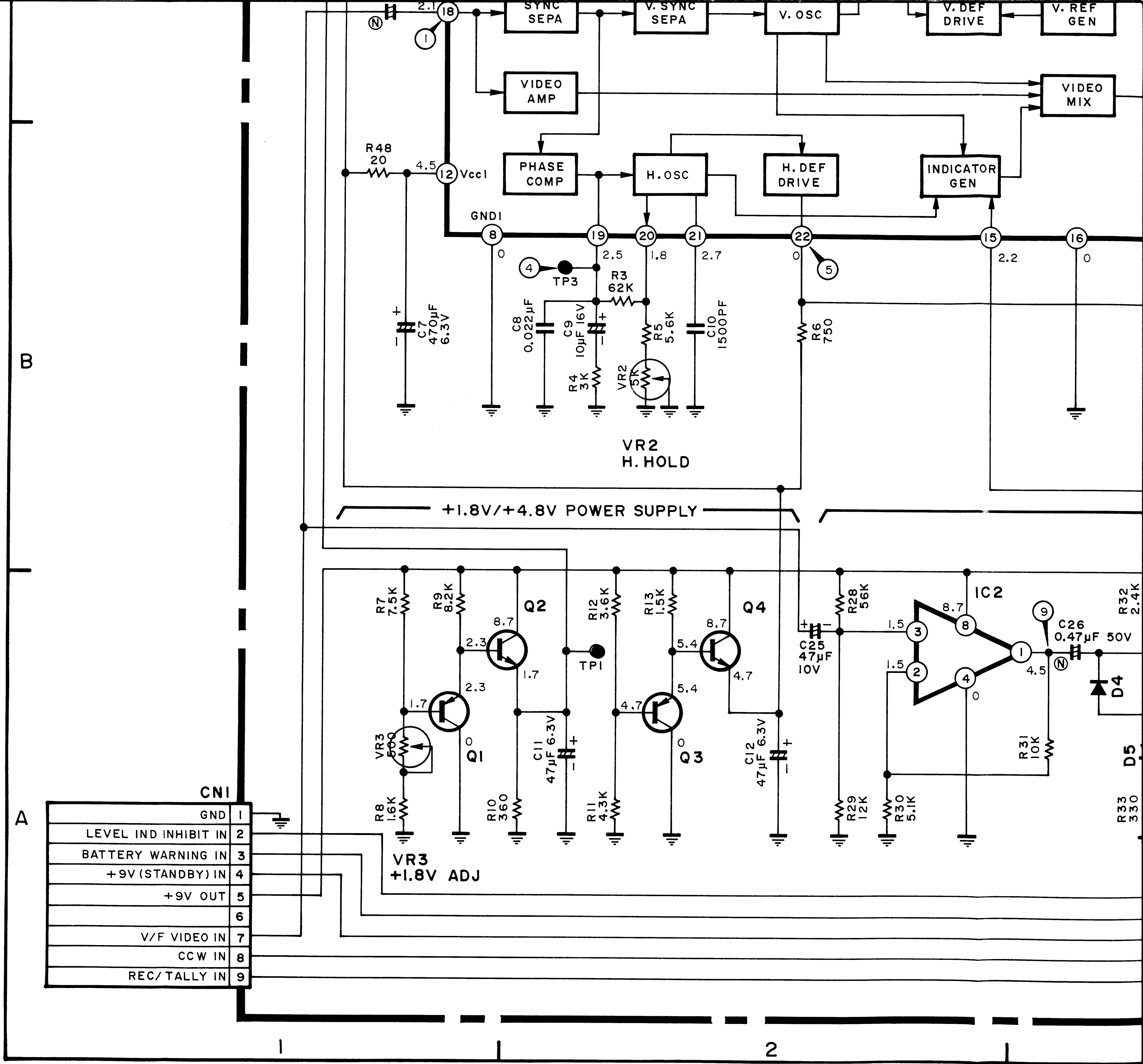
SCHEMATIC DIAGRAM OF 1.5″ VIEWFINDER WV-

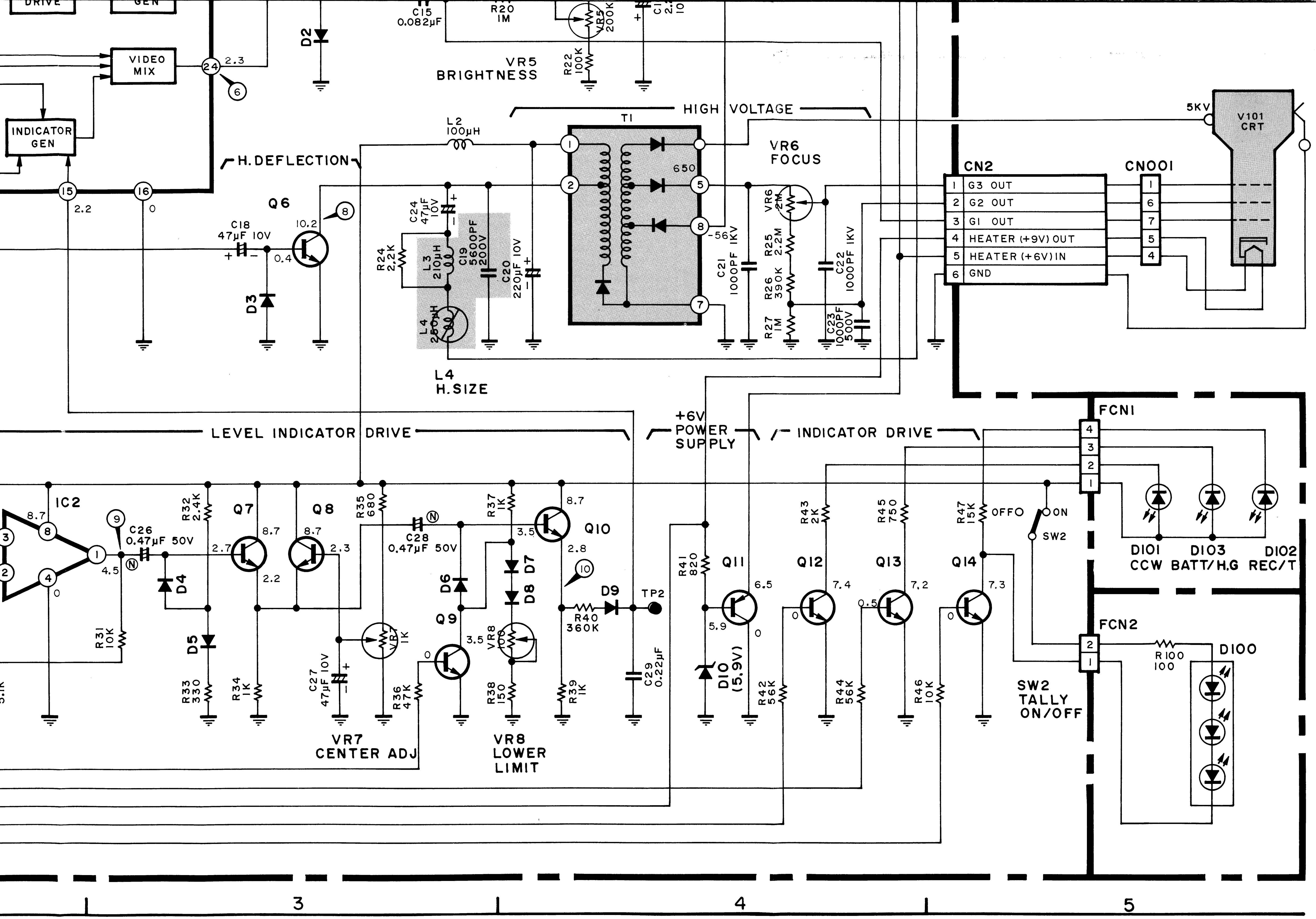

C
IC1
C1
2.2μF
50V
C2
470μF
6.3V
C3
910PF
C4
0.82μF
R1
5.1K
C5
47μF 6.3V
C6
220PF
R2
4.7
VR1
1K
VR1
V. SIZE
VR4
CONTRAST
VR4
2K
D1
R15
47
R16
820
Vcc2
GND2
SYNC
SEPA
V. SYNC
SEPA
V. OSC
V. DEF
DRIVE
V. REF
GEN
2
4
17
10
11
7
6
5
1
3
9
18
4.7
0
0
0.2
2.2
0.7
2.2
2.1
2.1
2.
0
2.1
1.7
2.1
1.6
-22.4
2.2
①
②
③
Ⓝ

M OF 1.5'' VIEWFINDER WV-VF30

IC1	AN2510	B2, B3, C2, C3
IC2	NJM4558M	A2
Q1	2SB641-RS	A1
Q2	2SD636-RS	A1, A2
Q3	2SB641-RS	A2
Q4	2SB642	A2
Q5	2SB642	C3
Q6	2SD1257A-Q	B3
Q7	2SD601-QRS	A3
Q8	2SD601-QRS	A3
Q9	2SD601-QRS	A3
Q10	2SD601-QRS	A4
Q11	2SA1096-QRS	A4
Q12	2SD1205-R	A4
Q13	2SD1205-R	A4
Q14	2SD1205-R	A5
D1	MA165	C3
D2	MA165	C3
D3	MA165	B3
D4	MA165	A3
D5	MA26	A3
D6	MA165	A3
D7	MA26	A3, A4
D8	MA26	A3, A4
D9	MA165	A4
D10	YFXZ059	A4
D100	LT9010D	A5
D101	LN33SGP-U	A5
D102	LN23SRP-D	A5
D103	LN43SYP	A5


VIDEO AMP
CN3
4 V DEFLECTION OUT
3 V DEFLECTION OUT
2 H DEFLECTION OUT
1 GND
L101
CRT
DEFLECTION
COIL
V
H
C6
220PF
R2
4.7
VR1
1K
VR1
V. SIZE
6.3V
2.1
2.1
2.0
2.1
1.7
③
6
5
1
3
9
V. DEF
DRIVE
V. REF
GEN
VR4
CONTRAST
VR4
2K
R15
47
R16
820
D1
R17
510
R18
24
C13
180PF
2.2
1.6
Q5
⑦
-22.4
SW1
OFF
ON
SW1
PEAKING
ON/OFF
C14
270PF
C17
47μF
6.3V
R19
4.7K
R21
62K
C15
0.082μF
R20
1M
VR5
200K
C16
2.2μF
100V
R23
1.6K


SYNC SEPA
V. SYNC SEPA
V. OSC
V. DEF DRIVE
V. REF GEN
VIDEO AMP
VIDEO MIX
PHASE COMP
H. OSC
H. DEF DRIVE
INDICATOR GEN
R48 20
Vcc1
GND1
TP3
TP1
R3 62K
C7 470μF 6.3V
C8 0.022μF
C9 10μF 16V
R4 3K
R5 5.6K
VR2 5K
C10 1500PF
R6 750
VR2 H. HOLD
+1.8V/+4.8V POWER SUPPLY
R7 7.5K
R9 8.2K
Q2
Q1
VR3 500
R8 1.6K
R10 360
C11 47μF 6.3V
R12 3.6K
R13 1.5K
Q4
Q3
R11 4.3K
C12 47μF 6.3V
C25 47μF 10V
R28 56K
R29 12K
IC2
R30 5.1K
R31 10K
C26 0.47μF 50V
D4
D5
R32 2.4K
R33 330
VR3 +1.8V ADJ
CN1
GND 1
LEVEL IND INHIBIT IN 2
BATTERY WARNING IN 3
+9V (STANDBY) IN 4
+9V OUT 5
6
V/F VIDEO IN 7
CCW IN 8
REC/TALLY IN 9
A
B
1
2

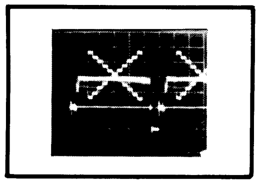

DRIVE
GEN
VIDEO MIX
INDICATOR GEN
C15 0.082μF
R20 1M
VR5 200K
R22 100K
VR5 BRIGHTNESS
D2
HIGH VOLTAGE
T1
L2 100μH
H. DEFLECTION
Q6
C18 47μF 10V
D3
C24 47μF 10V
R24 2.2K
L3 210μH
C19 5600PF 200V
C20 220μF 10V
L4 250μH
L4 H.SIZE
650
-56
C21 1000PF 1KV
VR6 FOCUS
VR6 2M
R25 2.2M
R26 390K
R27 1M
C22 1000PF 1KV
C23 1000PF 500V
5KV
V101 CRT
CN2
CN001
1 G3 OUT
2 G2 OUT
3 G1 OUT
4 HEATER (+9V) OUT
5 HEATER (+6V) IN
6 GND
LEVEL INDICATOR DRIVE
+6V POWER SUPPLY
INDICATOR DRIVE
FCN1
IC2
C26 0.47μF 50V
R31 10K
D4
D5
R32 2.4K
R33 330
Q7
Q8
R34 1K
R35 680
C27 47μF 10V
VR7 1K
R36 47K
VR7 CENTER ADJ
C28 0.47μF 50V
D6
Q9
R37 1K
D7
D8
VR8 10K
R38 150
VR8 LOWER LIMIT
Q10
R40 360K
D9
TP2
R39 1K
C29 0.22μF
R41 820
Q11
D10 (5.9V)
R42 56K
Q12
R43 2K
R44 56K
Q13
R45 750
R46 10K
Q14
R47 15K
OFF
ON
SW2
SW2 TALLY ON/OFF
D101 CCW
D103 BATT/H.G
D102 REC/T
FCN2
R100 100
D100
3
4
5

PRODUCT SAFETY NOTE

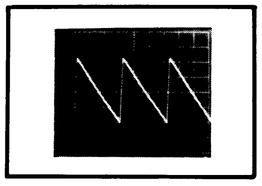
The shaded area on this schematic diagram incorporates special features important for protection from X-Radiation, fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

SIGNAL WAVEFORMS OF 1.5″ VIEWFINDER WV-VF30

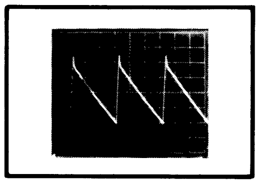
1 0.2V/DIV, 10μs/DIV



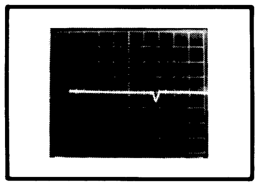
2 0.2V/DIV, 5ms/DIV



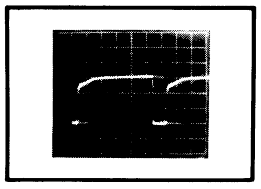
3 0.5V/DIV, 5ms/DIV



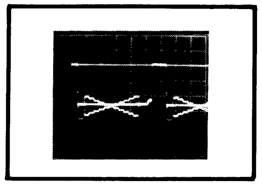
4 0.5V/DIV, 10μs/DIV



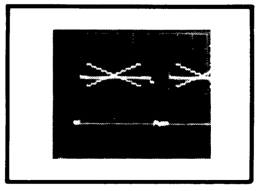
5 0.5V/DIV, 10μs/DIV



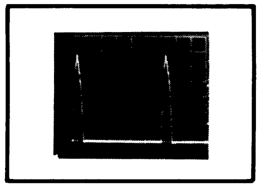
6 1V/DIV, 10μs/DIV



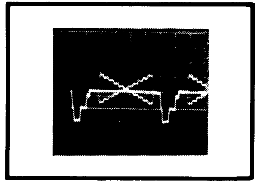
7 5V/DIV, 10μs/DIV



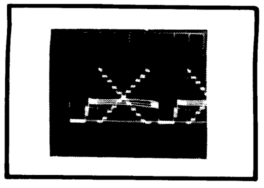
8 20V/DIV, 10μs/DIV



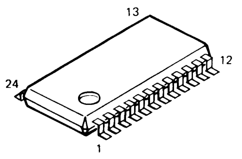
9 1V/DIV, 10μs/DIV



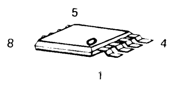
10 0.5V/DIV, 10μs/DIV



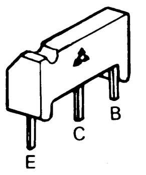
AN2510



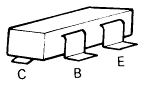
NJM4558M



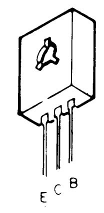
2SB641-RS
2SD636-RS
2SB642
2SD1205-R



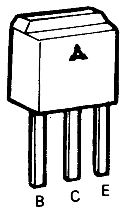
2SD601-QRS



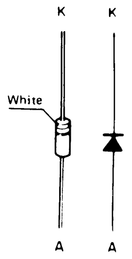
2SA1096-QRS



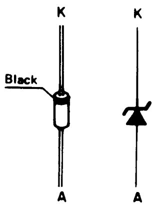
2SD1257A-Q



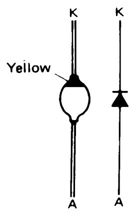
MA165



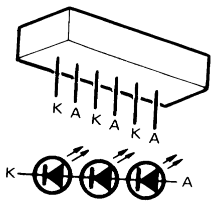
YFXZ059



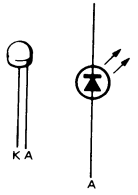
MA26


K
K
Yellow
A
A

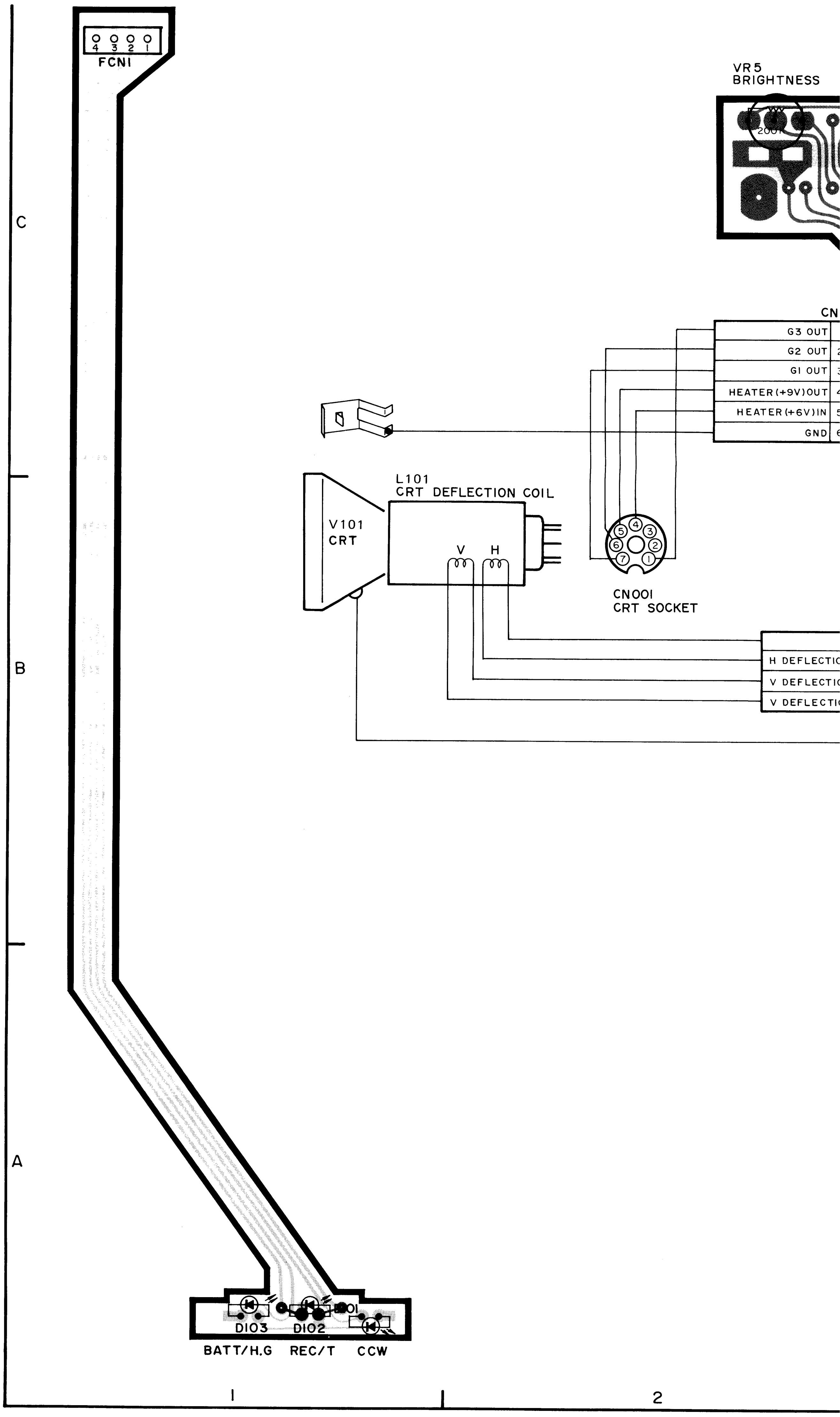
LT9010D



LN23SRP-D
LN33SGP-U
LN43SYP



CONDUCTOR V

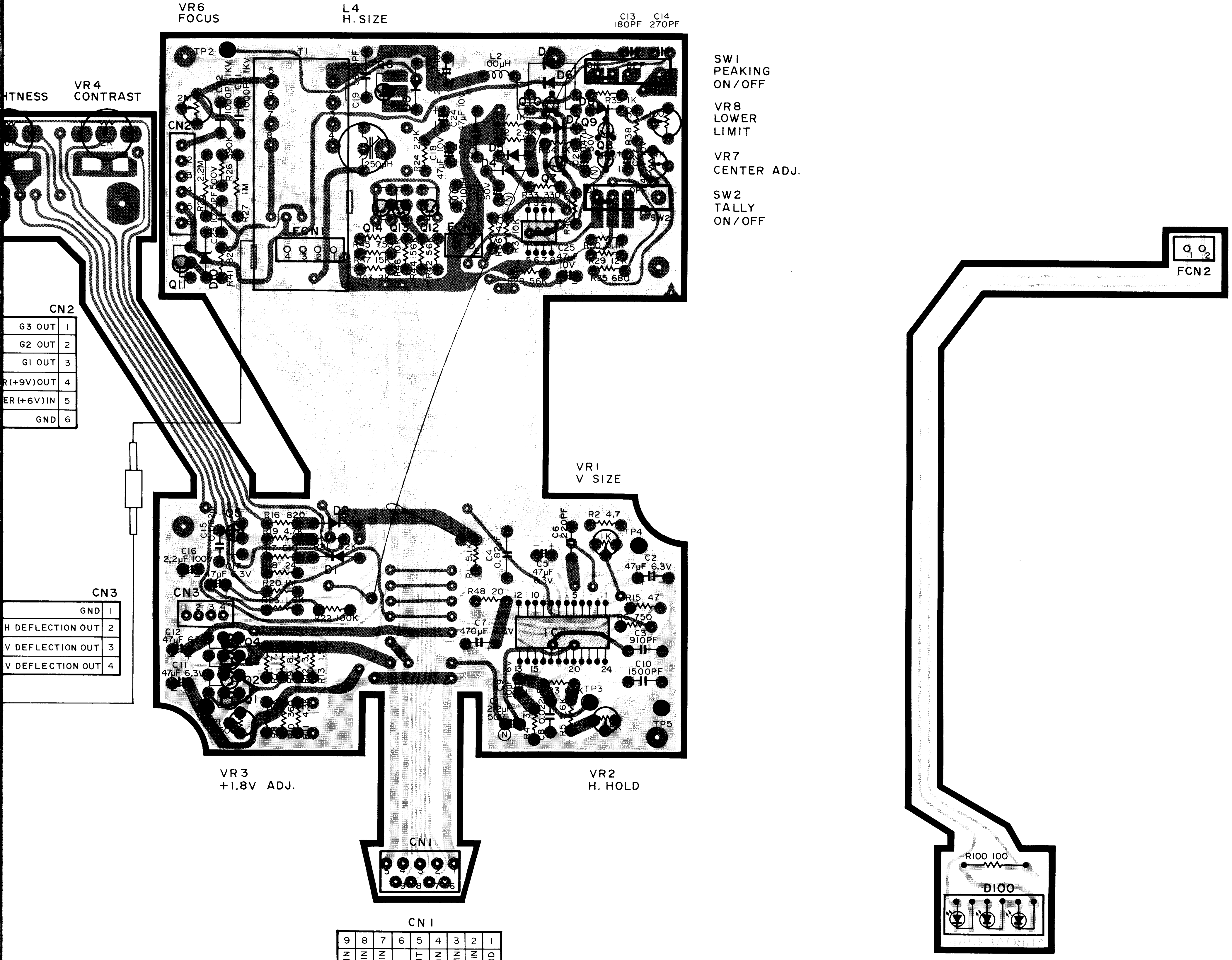

C
B
A
FCN1
4 3 2 1
VR5
BRIGHTNESS
200K
G3 OUT
G2 OUT
G1 OUT
HEATER(+9V)OUT
HEATER(+6V)IN
GND
L101
CRT DEFLECTION COIL
V101
CRT
V
H
CN001
CRT SOCKET
H DEFLECTIO
V DEFLECTIO
V DEFLECTI
D103
D102
D101
BATT/H.G
REC/T
CCW
1
2

IC1	AN2510	B4
IC2	NJM4558M	C4

Q1	2SB641-RS	B3
Q2	2SD636-RS	B3
Q3	2SB641-RS	B3
Q4	2SB642	B3
Q5	2SB642	B3
Q6	2SD1257A-Q	C3
Q7	2SD601-QRS	C4

Q8	2SD601-QRS
Q9	2SD601-QRS
Q10	2SD601-QRS
Q11	2SA1096-QRS
Q12	2SD1205-R
Q13	2SD1205-R
Q14	2SD1205-R

R VIEW OF 1.5'' VIEWFINDER WV-VF30


VR6
FOCUS
L4
H. SIZE
C13 180PF
C14 270PF
SW1
PEAKING
ON/OFF
VR8
LOWER
LIMIT
VR7
CENTER ADJ.
SW2
TALLY
ON/OFF
TNESS
VR4
CONTRAST
CN2
FCN1
FCN2
T1
TP2
L2 100µH
Q11
Q12
Q13
Q14
VR1
V SIZE
CN3
TP3
TP4
TP5
R16 820
C16 2.2µF 100V
C12 47µF
C11 47µF 6.3V
R22 100K
R48 20
C7 470µF
C6 220PF
C5 47µF 6.3V
C4 0.82µF
R2 4.7
C2 47µF 6.3V
R15 47
C3 910PF
C10 1500PF
VR3
+1.8V ADJ.
VR2
H. HOLD
CN1
R100 100
D100

G3 OUT	1
G2 OUT	2
G1 OUT	3
R (+9V) OUT	4
ER (+6V) IN	5
GND	6

GND	1
H DEFLECTION OUT	2
V DEFLECTION OUT	3
V DEFLECTION OUT	4

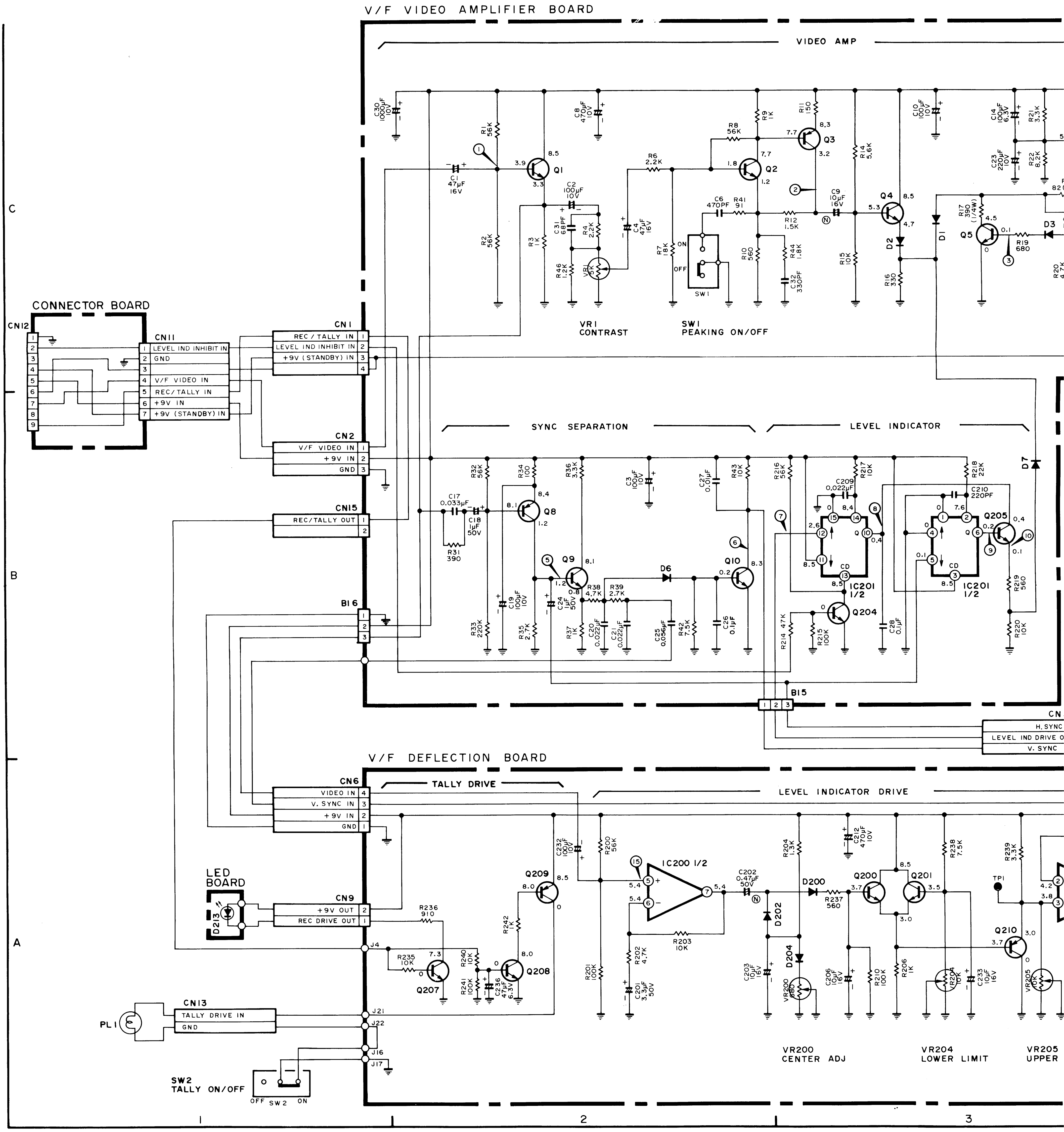
CN1

9	8	7	6	5	4	3	2	1
REC/TALLY IN	CCW IN	V/F VIDEO IN		+9V OUT	+9V (STANDBY) IN	BATTERY WARNING IN	LEVEL IND INHIBIT IN	GND

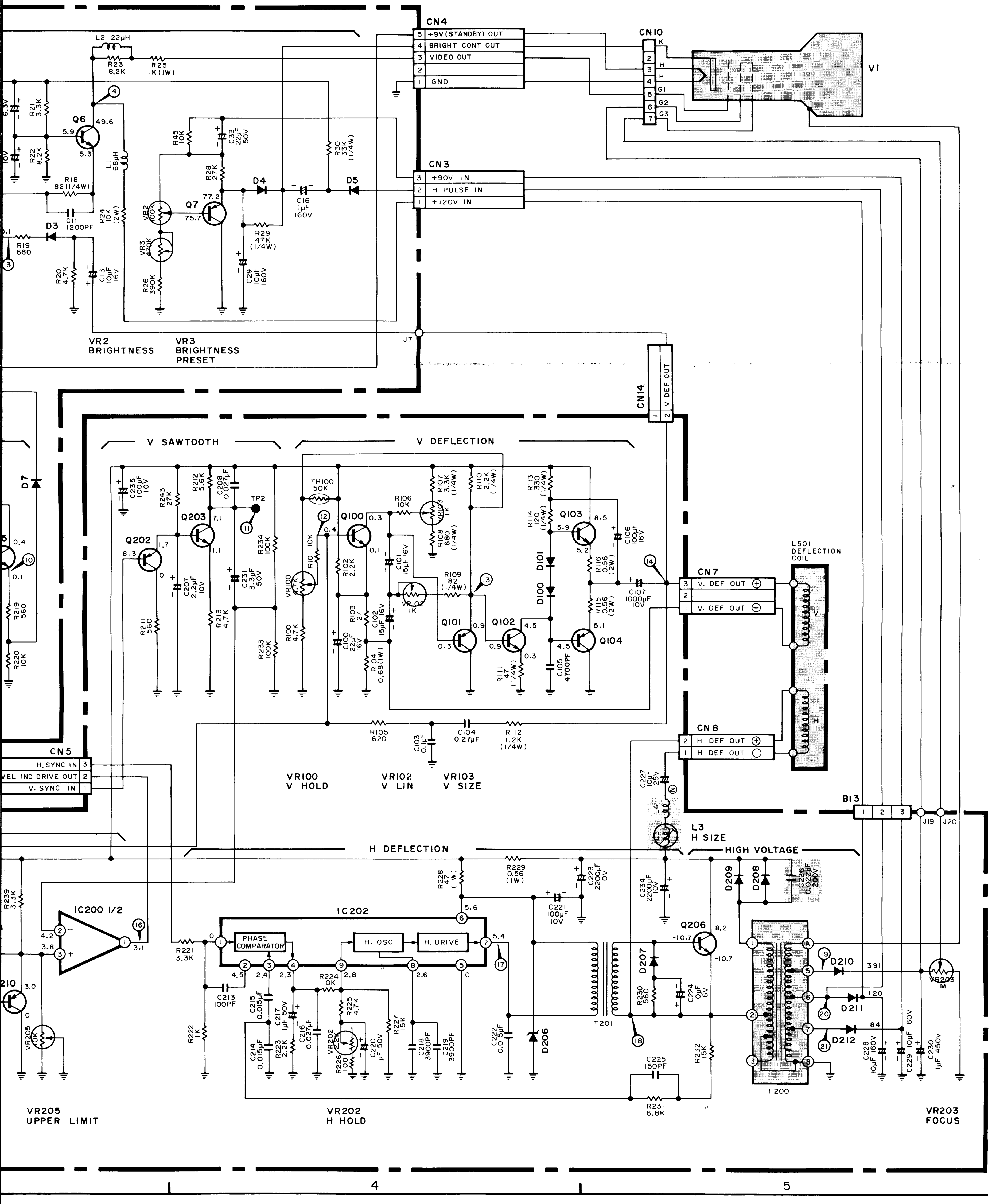
3 4 5

01-QRS	C4	D1	MA165	B3	D8	MA26	C4	D100	LT9010D	A5
01-QRS	C4	D2	MA165	B3	D9	MA165	C4	D101	LN33SGP-U	A1
01-QRS	C4	D3	MA165	C3	D10	YFXZ059	C3	D102	LN23SRP-D	A1
096-QRS	C3	D4	MA165	C3, C4				D103	LN43SYP	A1
205-R	C3	D5	MA26	C3, C4						
205-R	C3	D6	MA165	C4						
205-R	C3	D7	MA26	C4						

SCHEMATIC DIAGRAM OF 5


V/F VIDEO AMPLIFIER BOARD
VIDEO AMP
SYNC SEPARATION
LEVEL INDICATOR
V/F DEFLECTION BOARD
TALLY DRIVE
LEVEL INDICATOR DRIVE
CONNECTOR BOARD
CN12
CN11
LEVEL IND INHIBIT IN
GND
V/F VIDEO IN
REC/TALLY IN
+9V IN
+9V (STANDBY) IN
CN1
REC / TALLY IN
LEVEL IND INHIBIT IN
+9V (STANDBY) IN
CN2
V/F VIDEO IN
+9V IN
GND
CN15
REC/TALLY OUT
B16
B15
CN6
VIDEO IN
V. SYNC IN
+9V IN
GND
LED BOARD
D213
CN9
+9V OUT
REC DRIVE OUT
CN13
TALLY DRIVE IN
GND
PL1
SW2
TALLY ON/OFF
OFF SW2 ON
J4
J21
J22
J16
J17
H. SYNC
LEVEL IND DRIVE O
V. SYNC
VR1
CONTRAST
SW1
PEAKING ON/OFF
VR200
CENTER ADJ
VR204
LOWER LIMIT
VR205
UPPER
Q1
Q2
Q3
Q4
Q5
Q8
Q9
Q10
Q204
Q205
Q207
Q208
Q209
Q200
Q201
Q210
IC201 1/2
IC200 1/2
D1
D2
D3
D6
D7
D200
D202
D204
TP1
C30 1000μF 10V
C1 47μF 16V
R1 56K
R2 56K
R3 1K
C2 100μF 10V
C31 68PF
R4 2.2K
R46 1.2K
VR1 5K
C8 470μF 10V
C4 47μF 16V
R6 2.2K
R7 18K
R8 56K
R9 1K
R11 150
C6 470PF
R41 91
R10 560
R12 1.5K
R44 1.8K
C32 330PF
C9 10μF 16V
R14 5.6K
R15 10K
R16 330
C10 100μF 10V
C14 100μF 6.3V
C23 220μF 10V
R21 3.3K
R22 8.2K
R17 390 (1/4W)
R19 680
C17 0.033μF
C18 1μF 50V
R31 390
R32 56K
R33 220K
R34 100
R35 2.7K
R36 3.3K
R37 1K
R38 4.7K
R39 2.7K
C19 100μF 10V
C24 1μF 50V
C20 0.022μF
C21 0.022μF
C25 0.056μF
C3 100μF 10V
C27 0.01μF
R42 7.5K
C26 0.1μF
R43 10K
R216 56K
C209 0.022μF
R217 10K
R214 47K
R215 100K
C28 0.1μF
R218 22K
C210 220PF
R219 560
R220 10K
C232 100μF 10V
R200 56K
R201 100K
R202 4.7K
C201 3.3μF 50V
R203 10K
C202 0.47μF 50V
R204 1.3K
C212 470μF 10V
C203 10μF 16V
R237 560
C206 10μF 16V
R210 100K
R206 1K
R238 7.5K
C233 10μF 16V
R239 3.3K
R236 910
R235 10K
R240 10K
R241 100K
C236 47μF 6.3V
R242 1K
C
B
A
1
2
3

OF 5″ VIEWFINDER WV-VF35


CN4
+9V(STANDBY) OUT
BRIGHT CONT OUT
VIDEO OUT
GND
CN10
V1
CN3
+90V IN
H PULSE IN
+120V IN
Q6
Q7
D3
D4
D5
VR2 BRIGHTNESS
VR3 BRIGHTNESS PRESET
J7
CN14
V DEF OUT
V SAWTOOTH
V DEFLECTION
Q202
Q203
TP2
Q100
Q101
Q102
Q103
Q104
TH100 50K
D7
L501 DEFLECTION COIL
CN7
V. DEF OUT ⊕
V. DEF OUT ⊖
CN8
H DEF OUT ⊕
H DEF OUT ⊖
CN5
H.SYNC IN
VEL IND DRIVE OUT
V. SYNC IN
VR100 V HOLD
VR102 V LIN
VR103 V SIZE
B13
J19
J20
L3 H SIZE
L4
H DEFLECTION
HIGH VOLTAGE
IC200 1/2
IC202
PHASE COMPARATOR
H. OSC
H. DRIVE
Q206
D206
D207
D208
D209
D210
D211
D212
T200
T201
VR205 UPPER LIMIT
VR202 H HOLD
VR203 FOCUS
4
5

V/F DEFLECTION BOARD

IC200	YHSNJM4558D	A2, A3
IC202	AN5750	A4
Q100	2SD636-RS	B4
Q101	2SB641-RS	B4
Q102	2SD636-RS	B4
Q103	2SC1226-QR	B4, B5
Q104	2SA684-QR	B4, B5
Q200	2SD636-RS	A3
Q201	2SD636-RS	A3
Q202	2SB641-RS	B3
Q203	2SD636-RS	B4
Q206	2SD772B	A5
Q207	2SD1205-R	A2
Q208	2SD1205-R	A2
Q209	2SB793-QR	A2
Q210	2SA838-BC	A3
D100	MA161	B4
D101	MA161	B4
D200	MA165	A3
D202	MA165	A2
D204	MA165	A3
D206	YUDXZ068	A4
D207	YUDERB24-04C	A5
D208	YUDU06C	A5
D209	OA91	A5
D210	YUDERB24-04C	A5
D211	YUDERB24-04C	A5
D212	YUDERB24-04C	A5

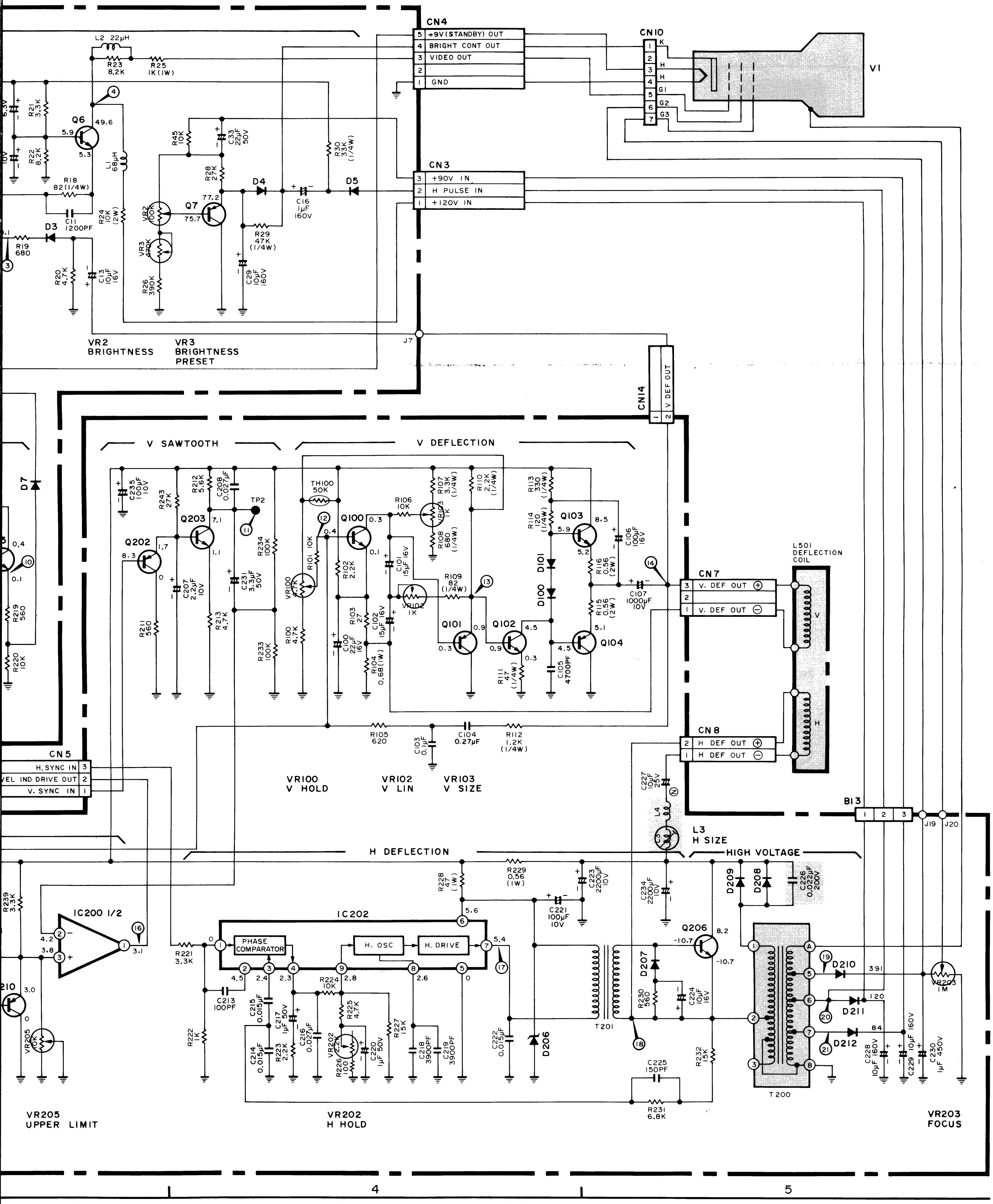
V/F VIDEO AMPLIFIER BOARD

IC201	TC4538BP	B3
Q1	2SD636-RS	C2
Q2	2SD636-RS	C2, C3
Q3	2SB641-RS	C3
Q4	2SD636-RS	C3
Q5	2SC1216-F	C3
Q6	2SC2258	C3
Q7	2SB641-RS	C4
Q8	2SB641-RS	B2
Q9	2SD636-RS	B2
Q10	2SD661-TU	B2
Q204	2SD636-RS	B3
Q205	2SD661-TU	B3
D1	MA161	C3
D2	MA161	C3
D3	MA162	C3
D4	YUDERB24-04C	C4
D5	OA91	C4
D6	MA165	B2
D7	MA165	B3

PRODUCT SAFETY NOTE

The shaded area on this schematic diagram incorporates special features important for protection from X-Radiation, fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

OF 5″ VIEWFINDER WV-VF35


CN4
5 +9V(STANDBY) OUT
4 BRIGHT CONT OUT
3 VIDEO OUT
2
1 GND
CN10
V1
CN3
3 +90V IN
2 H PULSE IN
1 +120V IN
L2 22μH
Q6
Q7
D3
D4
D5
VR2 BRIGHTNESS
VR3 BRIGHTNESS PRESET
J7
CN14
V DEF OUT
V SAWTOOTH
V DEFLECTION
Q202
Q203
Q100
Q101
Q102
Q103
Q104
TP2
TH100 50K
CN7
3 V. DEF OUT ⊕
2
1 V. DEF OUT ⊖
L501 DEFLECTION COIL
CN8
2 H DEF OUT ⊕
1 H DEF OUT ⊖
CN5
3 H.SYNC IN
2 LEVEL IND DRIVE OUT
1 V. SYNC IN
VR100 V HOLD
VR102 V LIN
VR103 V SIZE
B13
J19
J20
L4
L3 H SIZE
H DEFLECTION
HIGH VOLTAGE
IC200 1/2
IC202
PHASE COMPARATOR
H. OSC
H. DRIVE
Q206
T201
T200
D206
D207
D208
D209
D210
D211
D212
VR205 UPPER LIMIT
VR202 H HOLD
VR203 FOCUS
4
5

V/F DEFLECTION BOARD

IC200	YHSNJM4558D	A2, A3
IC202	AN5750	A4
Q100	2SD636-RS	B4
Q101	2SB641-RS	B4
Q102	2SD636-RS	B4
Q103	2SC1226-QR	B4, B5
Q104	2SA684-QR	B4, B5
Q200	2SD636-RS	A3
Q201	2SD636-RS	A3
Q202	2SB641-RS	B3
Q203	2SD636-RS	B4
Q206	2SD772B	A5
Q207	2SD1205-R	A2
Q208	2SD1205-R	A2
Q209	2SB793-QR	A2
Q210	2SA838-BC	A3
D100	MA161	B4
D101	MA161	B4
D200	MA165	A3
D202	MA165	A2
D204	MA165	A3
D206	YUDXZ068	A4
D207	YUDERB24-04C	A5
D208	YUDU06C	A5
D209	OA91	A5
D210	YUDERB24-04C	A5
D211	YUDERB24-04C	A5
D212	YUDERB24-04C	A5

V/F VIDEO AMPLIFIER BOARD

IC201	TC4538BP	B3
Q1	2SD636-RS	C2
Q2	2SD636-RS	C2, C3
Q3	2SB641-RS	C3
Q4	2SD636-RS	C3
Q5	2SC1216-F	C3
Q6	2SC2258	C3
Q7	2SB641-RS	C4
Q8	2SB641-RS	B2
Q9	2SD636-RS	B2
Q10	2SD661-TU	B2
Q204	2SD636-RS	B3
Q205	2SD661-TU	B3
D1	MA161	C3
D2	MA161	C3
D3	MA162	C3
D4	YUDERB24-04C	C4
D5	OA91	C4
D6	MA165	B2
D7	MA165	B3

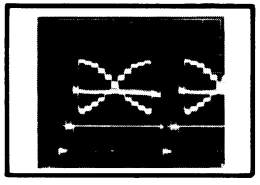
PRODUCT SAFETY NOTE

The shaded area on this schematic diagram incorporates special features important for protection from X-Radiation, fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

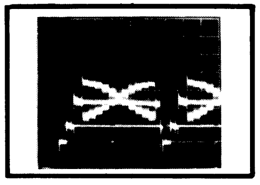
SIGNAL WAVEFORMS OF 5″ VIEWFINDER WV-VF35

CONDUC

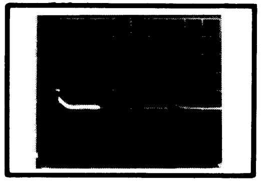
1 0.2V/DIV, 10μs/DIV



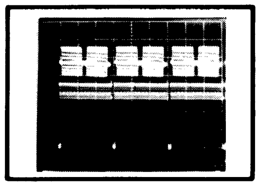
2 0.1V/DIV, 10μs/DIV



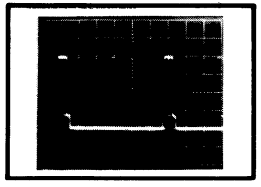
3 0.5V/DIV, 5ms/DIV



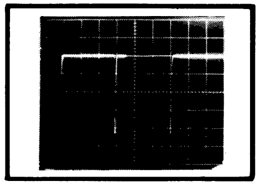
4 0.5V/DIV, 5ms/DIV



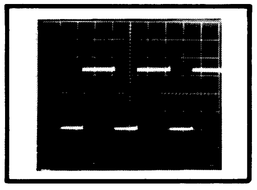
5 2V/DIV, 10μs/DIV



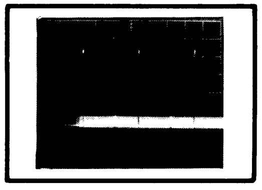
6 2V/DIV, 5ms/DIV



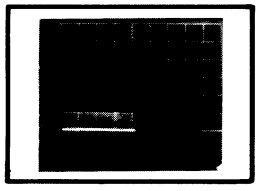
7 2V/DIV, 5ms/DIV



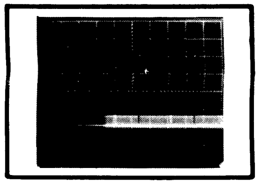
8 2V/DIV, 5ms/DIV



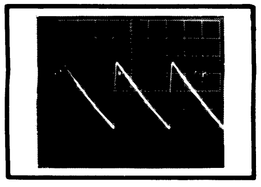
9 2V/DIV, 5ms/DIV



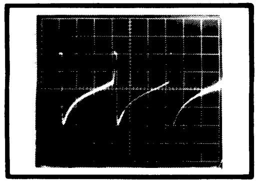
10 2V/DIV, 5ms/DIV



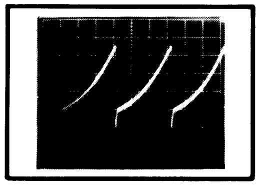
11 0.5V/DIV, 5ms/DIV



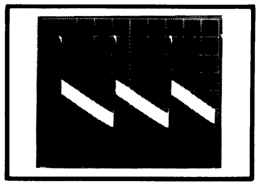
12 0.2V/DIV, 5ms/DIV



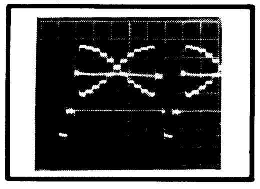
13 0.05V/DIV, 5ms/DIV



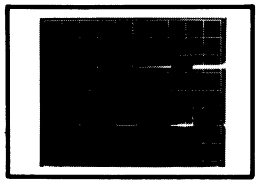
14 1V/DIV, 5ms/DIV



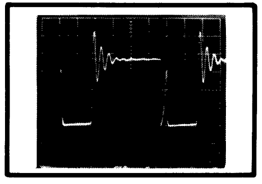
15 0.2V/DIV, 10μs/DIV



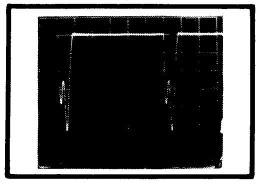
16 2V/DIV, 5ms/DIV



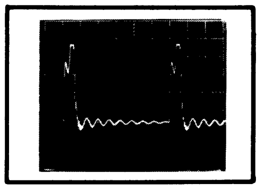
17 2V/DIV, 10μs/DIV



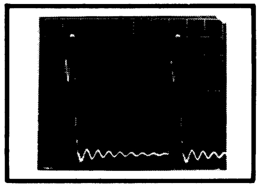
18 20V/DIV, 10μs/DIV



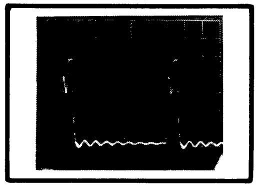
19 100V/DIV, 10μs/DIV



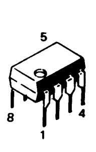
20 20V/DIV, 10μs/DIV



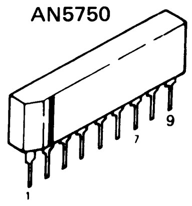
21 20V/DIV, 10μs/DIV



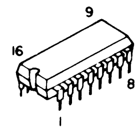
YHSNJM4558D



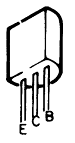
AN5750



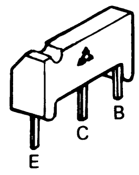
TC4538BP



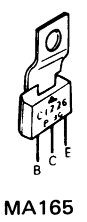
2SA684-QR
2SA838-BC



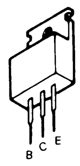
2SD661-TU
2SB793-QR
2SB641-RS
2SD636-RS
2SD1205-R



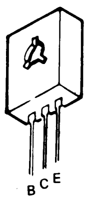
2SC1226-QR



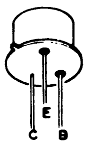
2SD772B



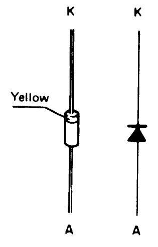
2SC2258



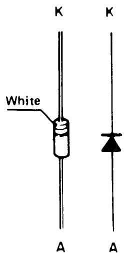
2SC1216-F



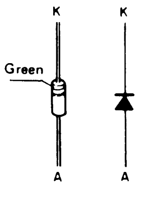
OA91


K
K
Yellow
A
A

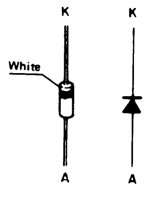
MA165



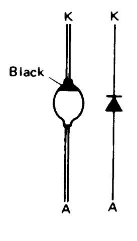
MA161



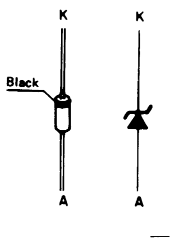
YUDERB24-04C



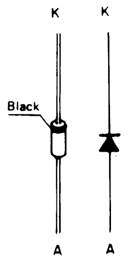
YUDU06C

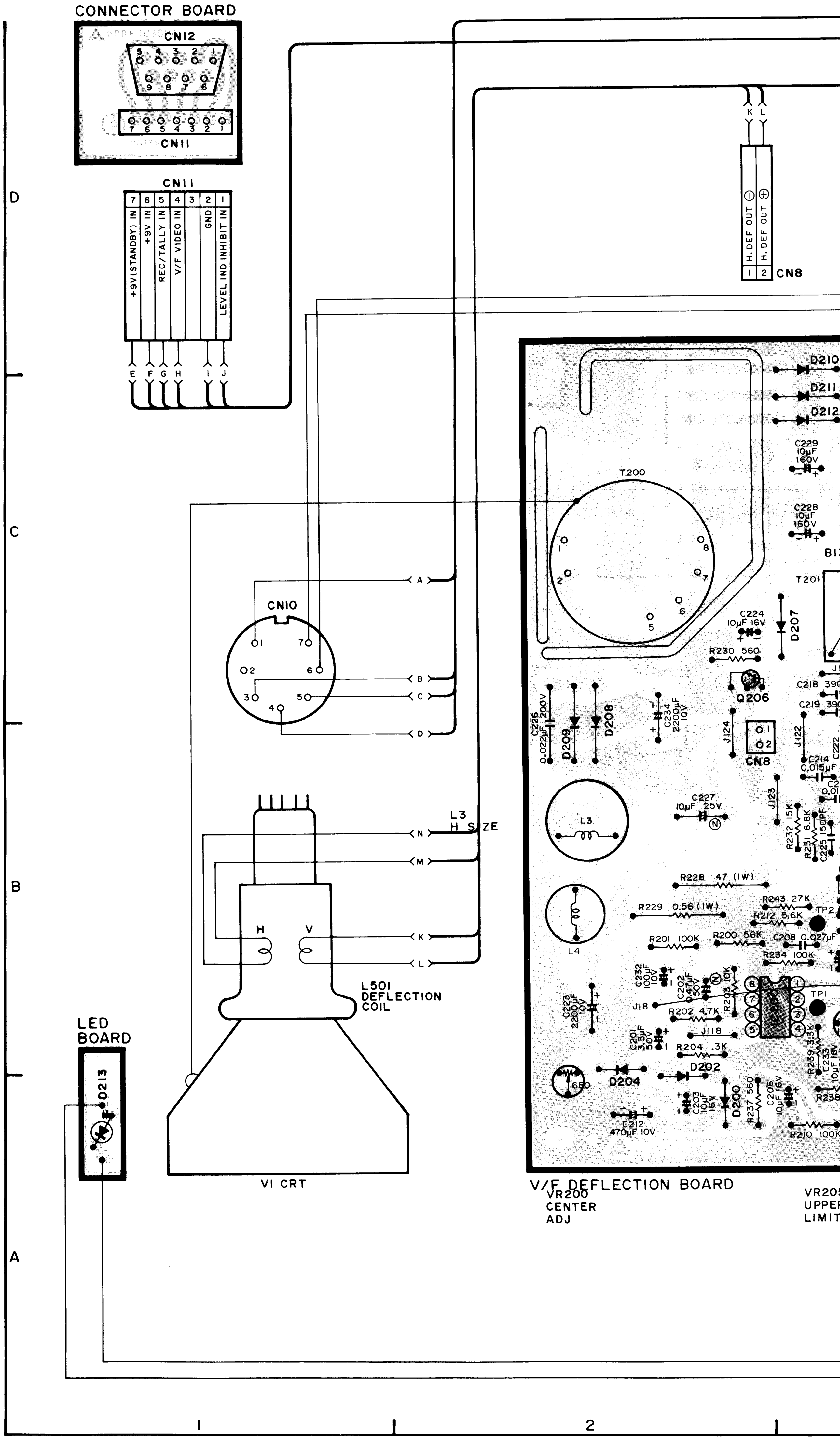


YUDXZ068



MA162

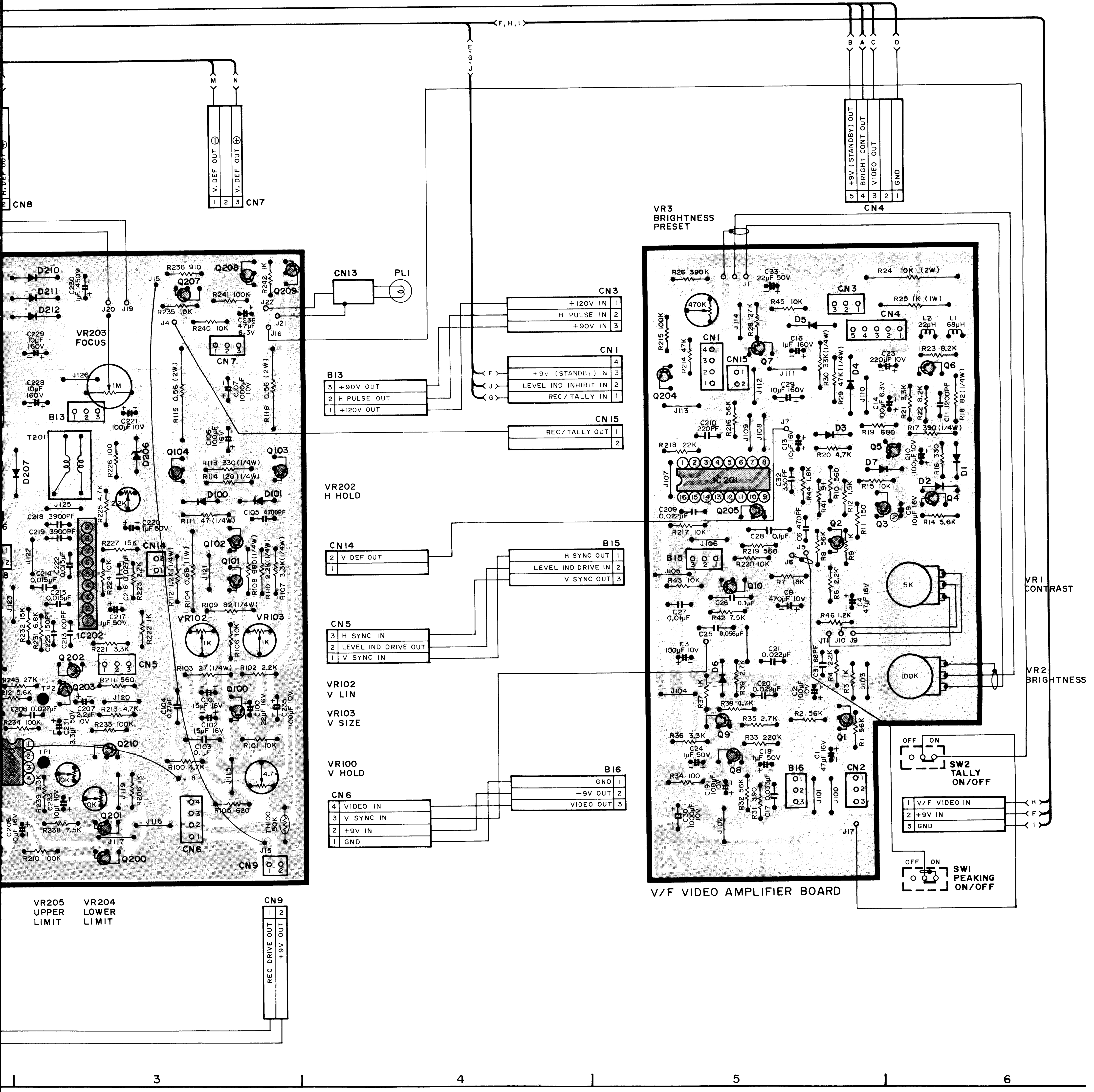



CONNECTOR BOARD
CN12
CN11
+9V(STANDBY) IN
+9V IN
REC/TALLY IN
V/F VIDEO IN
GND
LEVEL IND INHIBIT IN
E F G H I J
D
C
B
A
1
2
CN10
A
B
C
D
L3
H SIZE
N
M
K
L
H
V
L501
DEFLECTION
COIL
LED
BOARD
D213
V1 CRT
H.DEF OUT
CN8
D210
D211
D212
C229 10μF 160V
C228 10μF 160V
T200
T201
C224 10μF 16V
D207
R230 560
Q206
C218
C219
C226 0.022μF 200V
D209
D208
C234 2200μF 10V
J124
J122
C214 0.015μF
C227 10μF 25V
J123
R232 15K
R231 6.8K
C225 150PF
L3
R228 47 (1W)
R229 0.56 (1W)
R243 27K
R212 5.6K
TP2
L4
R201 100K
R200 56K
C208 0.027μF
R234 100K
C232 100μF 10V
C202 0.47μF 50V
R233 10K
J18
R202 4.7K
J118
IC200
TP1
C223 2200μF 10V
C201 3.3μF 50V
R204 1.3K
D202
D204
C203 10μF 16V
D200
R237 560
C206 10μF 16V
R239 3.3K
C233 10μF 16V
R238
C212 470μF 10V
R210 100K
V/F DEFLECTION BOARD
VR200
CENTER
ADJ
VR20
UPPE
LIMIT

V/F DEFLECTION BOARD

IC200	YHSNJM4558D	B2, B3	Q202	2SB641-RS	B3	D100	MA161	C3
IC202	AN5750	B3, C3	Q203	2SD636-RS	B3	D101	MA161	C3
			Q206	2SD772B	C2	D200	MA165	A2
Q100	2SD636-RS	B3	Q207	2SD1205-R	C3	D202	MA165	A2, B2
Q101	2SB641-RS	B3	Q208	2SD1205-R	C3, D3	D204	MA165	A2, B2
Q102	2SD636-RS	B3, C3	Q209	2SB793-QR	C3, D3	D206	YUDXZ068	C3
Q103	2SC1226-QR	C3	Q210	2SA838-BC	B3	D207	YUDERB24-04C	C3
Q104	2SA684-QR	C3				D208	YUDU06C	B2, C2
Q200	2SD636-RS	A3				D209	0A91	B2, C2
Q201	2SD636-RS	A3, B3						

NDUCTOR VIEW OF 5" VIEWFINDER WV-VF35

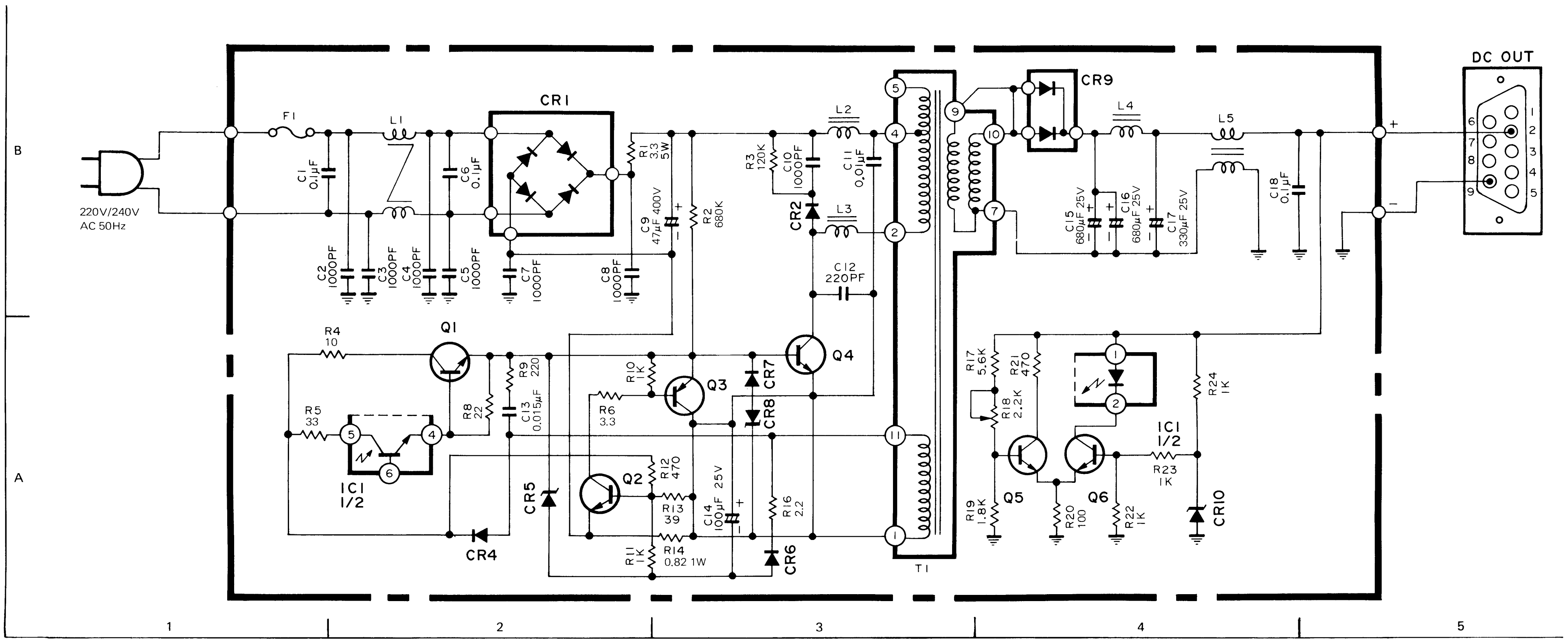

CN8
CN7
V. DEF OUT ⊖
V. DEF OUT ⊕
M
N
F, H, I
E, G, J
B A C D
+9V (STANDBY) OUT
BRIGHT CONT OUT
VIDEO OUT
GND
CN4
VR3 BRIGHTNESS PRESET
CN13
PL1
CN3
+120V IN
H PULSE IN
+90V IN
CN1
+9V (STANDBY) IN
LEVEL IND INHIBIT IN
REC/TALLY IN
B13
+90V OUT
H PULSE OUT
+120V OUT
CN15
REC/TALLY OUT
VR203 FOCUS
VR202 H HOLD
CN14
V DEF OUT
B15
H SYNC OUT
LEVEL IND DRIVE IN
V SYNC OUT
CN5
H SYNC IN
LEVEL IND DRIVE OUT
V SYNC IN
VR102 V LIN
VR103 V SIZE
VR100 V HOLD
B16
GND
+9V OUT
VIDEO OUT
CN6
VIDEO IN
V SYNC IN
+9V IN
GND
CN9
REC DRIVE OUT
+9V OUT
VR205 UPPER LIMIT
VR204 LOWER LIMIT
VR1 CONTRAST
VR2 BRIGHTNESS
SW2 TALLY ON/OFF
OFF
ON
V/F VIDEO IN
+9V IN
GND
SW1 PEAKING ON/OFF
V/F VIDEO AMPLIFIER BOARD
IC201
IC202
T201
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q100
Q101
Q102
Q103
Q104
Q200
Q201
Q202
Q203
Q204
Q205
Q207
Q208
Q209
Q210
3
4
5
6

C3	D210	YUDERB24-04C	C3, D3
C3	D211	YUDERB24-04C	C3
A2	D212	YUDERB24-04C	C3
A2, B2			
A2, B2			
C3			
C3			
B2, C2			
B2, C2			

V/F VIDEO AMPLIFIER BOARD

IC201	TC4538BP	C5	Q7	2SB641-RS	C5	D1	MA161	C6
			Q8	2SB641-RS	B5	D2	MA161	C6
Q1	2SD636-RS	B5	Q9	2SD636-RS	B5	D3	MA162	C5
Q2	2SD636-RS	B5, C5	Q10	2SD661-TU	B5	D4	YUDERB24-04C	C5
Q3	2SB641-RS	C5, C6	Q204	2SD636-RS	C5	D5	0A91	C5
Q4	2SD636-RS	C6	Q205	2SD661-TU	C5	D6	MA165	B5
Q5	2SC1216-F	C5, C6				D7	MA165	C5, C6
Q6	2SC2258	C6						

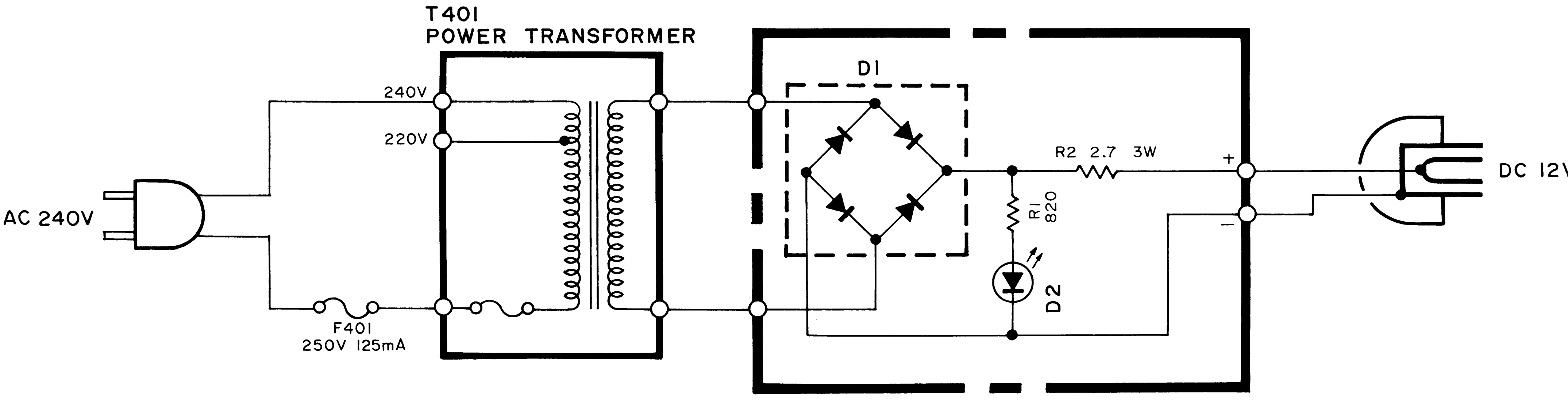
SCHEMATIC DIAGRAM OF AC ADAPTOR WV-PS30


220V/240V
AC 50Hz
B
A
F1
L1
C1 0.1μF
C2 1000PF
C3 1000PF
C4 1000PF
C5 1000PF
C6 0.1μF
C7 1000PF
C8 1000PF
CR1
R1 3.3 5W
C9 47μF 400V
R2 680K
R3 120K
C10 1000PF
L2
C11 0.01μF
CR2
L3
C12 220PF
Q1
R4 10
R5 33
IC1 1/2
R8 22
R9 220
C13 0.015μF
CR4
CR5
Q2
R12 470
R13 39
R11 1K
R14 0.82 1W
R10 1K
R6 3.3
Q3
C14 100μF 25V
CR7
CR8
R16 2.2
CR6
Q4
T1
CR9
L4
L5
C15 680μF 25V
C16 680μF 25V
C17 330μF 25V
C18 0.1μF
R17 5.6K
R18 2.2K
R19 1.8K
R21 470
R20 100
Q5
Q6
R22 1K
R23 1K
R24 1K
CR10
DC OUT
+
−
1
2
3
4
5

IC1	TLP531GR	A2, A4
Q1	2SC2655-Y	A2
Q2	2SC945-PQ	A2
Q3	2SA1020-Y	A3
Q4	2SC2792	A3
Q5	2SC945-PQ	A4
Q6	2SC945-PQ	A4

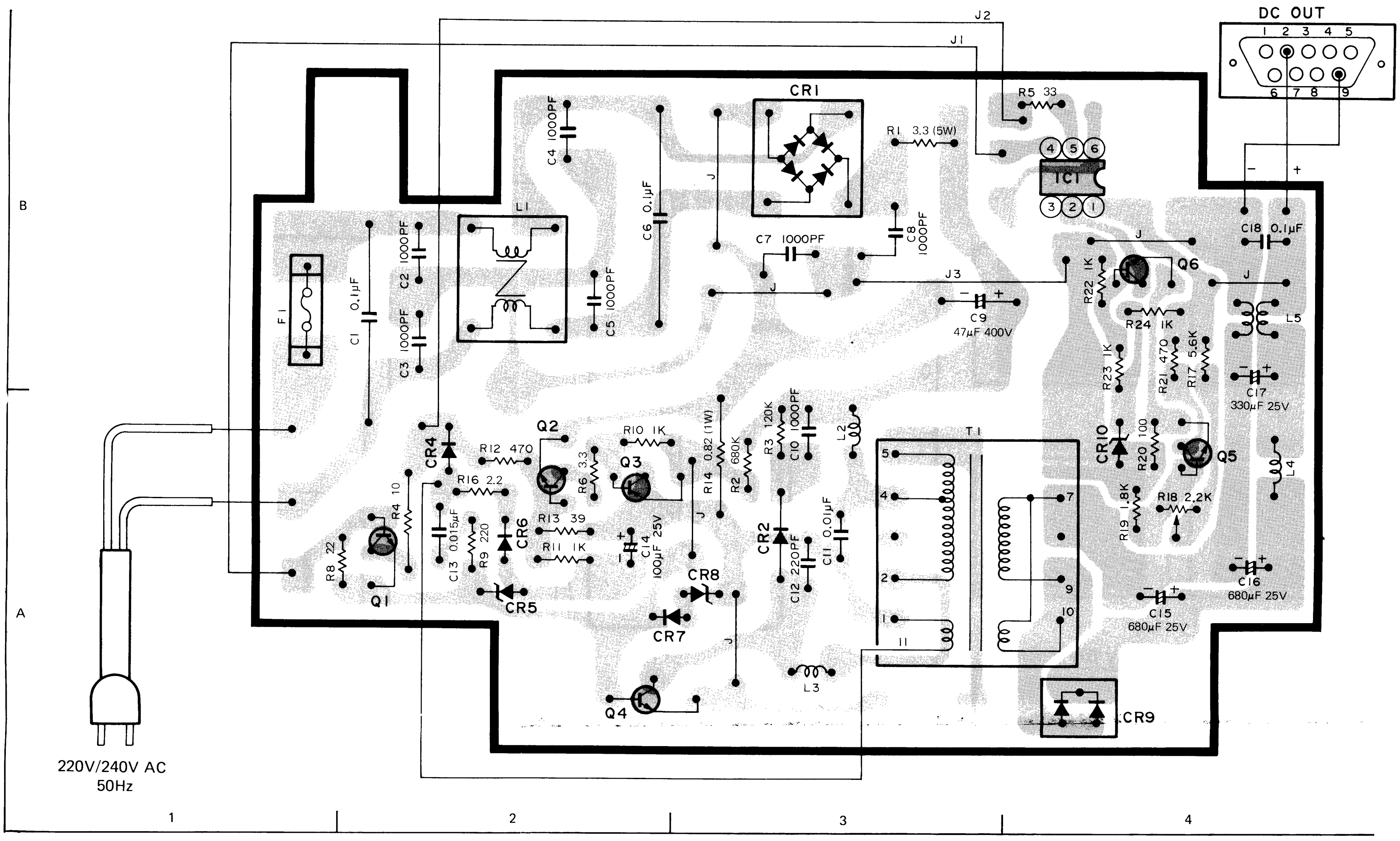
CR1	KBPC606	B2
CR2	RGP10K	B3
CR4	1S954	A2
CR5	RD4.7EB2	A2
CR6	7S954	A3
CR7	1S954	A3
CR8	RD4.7EB2	A3
CR9	ESAB82-004	B4
CR10	RD5.1EB2	A4

SCHEMATIC DIAGRAM OF BATTERY CHARGER WV-BC30


T401
POWER TRANSFORMER
AC 240V
240V
220V
F401
250V 125mA
D1
R2 2.7 3W
R1 820
D2
+
−
DC 12

D1	RB152
D2	LN21RPH

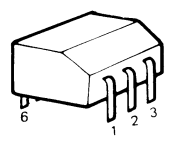
CONDUCTOR VIEW OF AC ADAPTOR WV-PS30



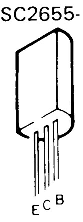
J2
J1
DC OUT
1 2 3 4 5
6 7 8 9
CR1
R5 33
R1 3.3 (5W)
IC1
4 5 6
3 2 1
C4 1000PF
C6 0.1µF
C7 1000PF
C8 1000PF
L1
F1
C1 0.1µF
C2 1000PF
C3 1000PF
C5 1000PF
J
J3
C9 47µF 400V
C18 0.1µF
Q6
R22 1K
R24 1K
L5
R23 1K
R21 470
R17 5.6K
C17 330µF 25V
CR10
R20 100
Q5
L4
R19 1.8K
R18 2.2K
C16 680µF 25V
C15 680µF 25V
T1
CR9
CR4
R12 470
Q2
R10 1K
R14 0.82 (1W)
R2 680K
R3 120K
C10 1000PF
L2
R16 2.2
R6 3.3
Q3
R4 10
R8 22
Q1
C13 0.015µF
R9 220
CR6
R13 39
R11 1K
C14 100µF 25V
CR2
C12 220PF
C11 0.01µF
CR8
CR5
CR7
L3
Q4
220V/240V AC
50Hz
B
A
1
2
3
4

IC1	TLP531GR	B4
Q1	2SC2655-Y	A2
Q2	2SC945-PQ	A2
Q3	2SA1020-Y	A2
Q4	2SC2792	A2
Q5	2SC945-PQ	A4
Q6	2SC945-PQ	B4
CR1	KBPC606	B3
CR2	RGP10K	A3
CR4	1S954	A2
CR5	RD4.7EB2	A2
CR6	7S954	A2
CR7	7S954	A2, A3
CR8	RD4.7EB2	A3
CR9	ESAB82-004	A4
CR10	RD5.1EB2	A4

TLP531GR



2SA1020-Y
2SC2655-Y



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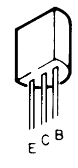

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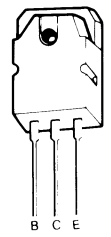
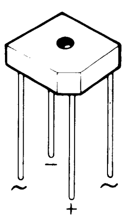
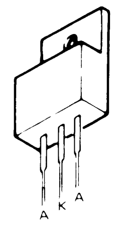


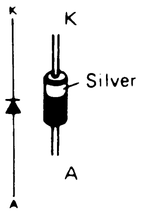
KBPC606



ESAB82-004

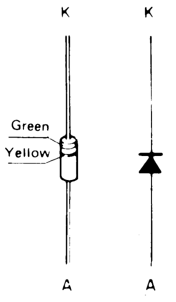


RGP10K



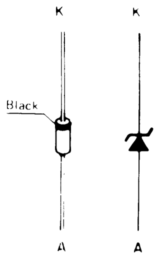
K
K
Silver
A
A

1S954



K
K
Green
Yellow
A
A

RD4-7EB2
RD5-1EB2



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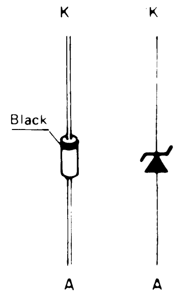
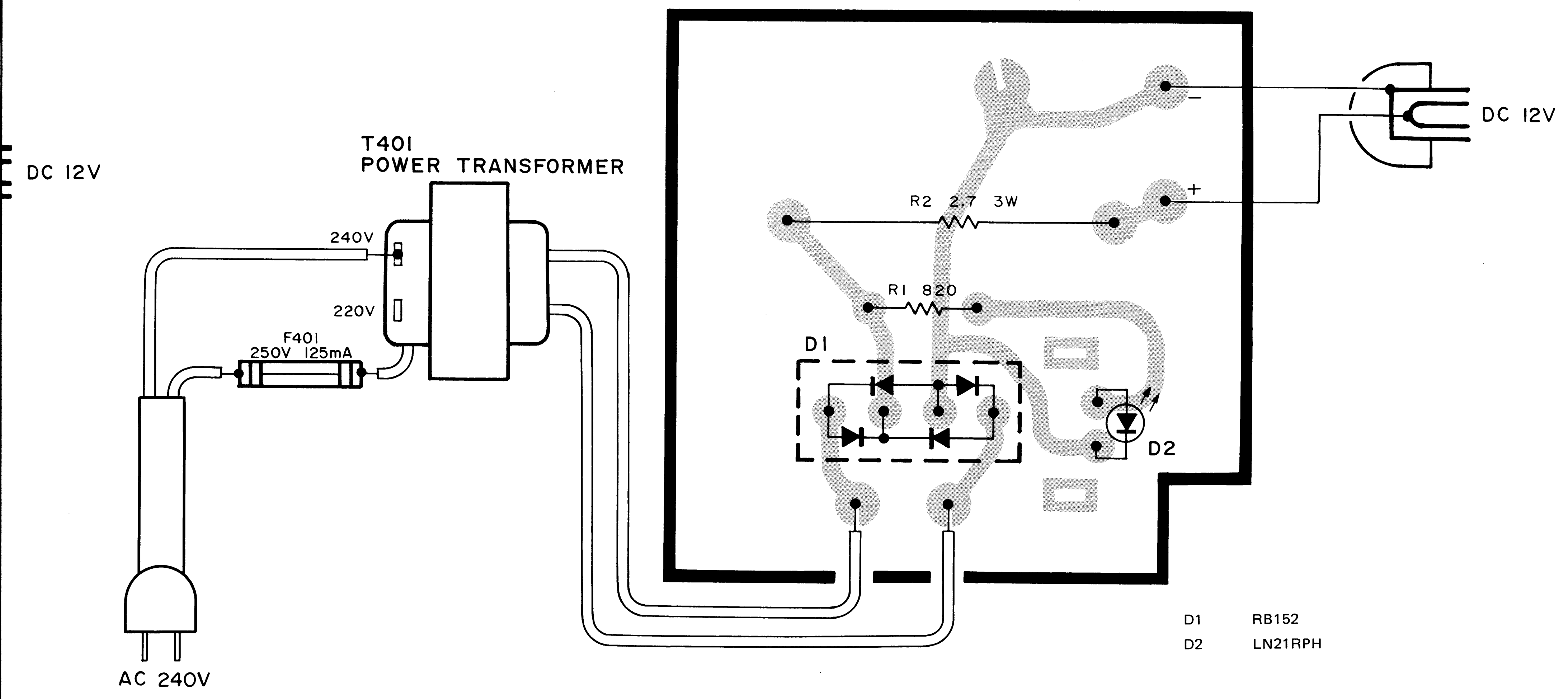


CONDUCTOR VIEW OF BATTERY CHARGER WV-BC30



DC 12V
T401
POWER TRANSFORMER
240V
220V
F401
250V 125mA
AC 240V
R2 2.7 3W
R1 820
D1
D2
−
+
DC 12V

D1	RB152
D2	LN21RPH

ORDER NO. VKD82100662C8

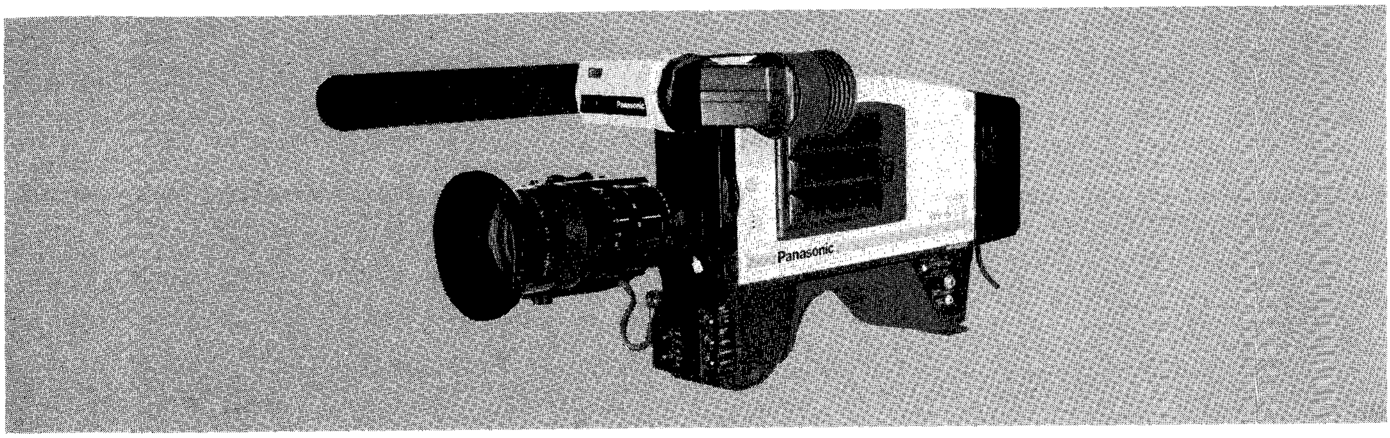
Service Manual

Vol. 4

Replacement Parts List
Exploded View

Colour Video Camera

WV-777 Series



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Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Important Notice

REPLACEMENT PARTS LIST

1. Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
2. Components identified by * mark are new parts used from this model.

WV-777 CAMERA

MISCELLANEOUS

SYMBOL NO.	PART NO.	DESCRIPTION
V001~003	H4101	Pick up Tube
Q001	2SA1061-P	Transistor
D001	BD607RG	LED
D002	ESAB82-004	Diode
L001	YFVAKA0053AN	Deflection Coil Ass'y
R001~003	ERD10TJ750	Carbon 75Ω 1/8W
C001	ELQV05104JZ	Plastic 0.1μF 50V
SW001	YFM2012ES	Auto/Manual Selection Switch
SW002	YFM2028ES	Auto White/Auto Black Selection Switch
SW003	YFM2023ESG	Hight/Gain Selection Switch
SW004	YFM2012ESG	Color/Ber/Camera Selection Switch
SW005	YFM2022ESG3	Standby/Operate Section Switch
SW006	YFM2013ES	VTR, RCU/BATT, ACADP Selection Switch
SW007	YFM2032ESG3	RCU/VTR Selection Switch
CN001	YFJMR2532M	RCU Connector
CN002	YFCB02A1614P	VTR Connector
CN003~005	YWBNC-R	BNC Connector
CN006	YFDEC9PF0	9 pin Connector
CN007	YWLJ145-1A	Intercom Jack
CN008	YW-SJ296	Audio Monitor Jack
CN009	YFFM16R03H	3pin Connector
CN010	YFXLR4-32 or YFFM16R03H	4pin Connector 3pin Connector
CN011	YFFM16R03H	3pin Connector
CN013	YFR0102R98F	Lens Connector
CN015-PM	EMCC0717D42V	7 pin plug Male for BI2 (Mother Board)
CN015-PF	EMCB0714D65	7 pin Plug Female for CN001
CN016-PM	EMCC0720B63X	7 pin Plug Male for CN001, CN002
CN016-PF	EMCB0717B62V	7 pin plug Female for BI1 (Mother Board)
CN017-PM	EMCC0906B52X	9 pin plug Male for SW007 and CN008
CN017-PF	EMCB0920B52X	9 pin plug Female for CN001, CN002 and CN004
CN1-PF	EMCM0360C52	3 pin plug Female for Mic Connection Board
CN1-PF	EMCM0420C52	4 pin Plug Female for Mic Board
CN2-PF	EMCM0320C54	3 pin plug Female for Mic Board
CN14-PF	EMCM0440D65	4 pin plug Female for Mother Board
CN15-PF	EMCM1040D62X	10 pin plug Female for Mother Board
CN18-PF	EMCM0222D62S	2 pin plug Female for Mother Board
CN19-PF	EMCM0407D52S	4 pin plug Female for Mother Board
CN20-PF	EMCM0308D52S	3 pin plug Female for Mother Board
CN21-PF	EMCM1022B56X	10 pin plug Female for Mother Board
CN23-PF	EMCM1320B62X	13 pin plug Female for Mother Board
M001	*YFV2KA0032BS	Front Chassis Ass'y
M002	*YFV5WA0057A	Mounting Plate for Lens Connector
M003	*YFV2SA0029A4	Mounting Angle for Connector
M004	*YFV5EA0043A3	Filter Cover
M005	*YFV5KA0014A3	Filter Case
M006	*YFV4JA0021C4	Spring Plate A for Filter Case
M007	*YFV4JA0022C4	Spring Plate B for Filter Case
M008	*YFV5EA0041A3	Front Bottom Mounting Plate
M009	*YFV5EA0040A3	Front Bottom Cover
M010	*YFV2CA0015C4	Mounting Plate for Bottom Chassis
M011	*YFV6FA0007A3	Battery Cap
M012	*YFV7SA0038A4	Battery Label
M013	*YFV2EA0008A4	Guide Stopper
M015	*YFV2RA0001A3	Battery Case
M016	*YFV2TA0008A3	Mounting Plate for Battery
M017	*YFV5EA0044A4	Mounting Bracket for 5" EVF
M018	*YFV2KA0030A1	Main Chassis
M019	*YFV7SA0039A4	Indicator Label
M020	*YFV2SA0030A4	Mounting Bracket A for Circuit Board
M021	*YFV2SA0032A4	Support Plate A for Circuit Board
M022	YWV52-BM01	Lock Screw (X2)
M023	YFEDS2	Cord Clamp A (X3)
M024	YFS10	Cord Clamp B (X4)
M025	YFLWS2NS	Cord Clamp C (X3)
M026	*YFV2SA0034A4	Mounting Bracket B for Circuit Board
M027	*YFV2SA0031A4	Support Plate B for Circuit Board
M028	*YFV5EA0042A2	Rear Bottom Cover
M029	*YFV5VA0008A2	Shoulder Pad
M030 ⚠	*YFV7QA0182B4	Main Label
M031	*YFV2SA0033A4	Mounting Angle for 9P Connector
M032	*YFV2PA0016A4	Insulator Paper for Transistor
M033	*YFV2KA0031B2	Rear Chassis
M034	*YFV2VA0006A4	Brank Plate for Slider
M035	*YFV2VA0007A4	Guide Brank Plate
M036	*YFV5DA0006B3	Rear Decoration Plate
M037	*YFV1EA0018A4	Decoration Screw
M038 ⚠	*YFV7SA0023A4	Caution Label (X3)
M039	YVZC700RB50	Serial No. Label
M040	*YFV6AA0002B2	Handle
M041	*YFV6AA0003A3	Grip A
M042	*YFV6AA0004A3	Grip B
M043	*YFV5DA0003A4	Grip Leather
M044	*YFV7SA0042A4	Mic Caution Label
M045	*YFV1EA0007A4	EVF Mounting Screw
M046	*YFV1KA0005A4	EVF Mounting Washer
M047	*YFV4JA0020A4	EVF Mounting Spring
M048	*YFV6FA0006A3	Mic Holder
M049	*YFV2EA0003A4	Mic Guide
M050	*YFV5DA0002A3	Mic Connection Board Cover
M051	YFHOLEPLUG10	Hole Plug
M052	*YFV5WB0054AS	Power Operation Panel Ass'y
M053	YWA620AER01	Insulater Washer A for Intercom Jack
M054	*YFV1KA0004A4	Insulater Washer B for Audio Monitor Jack

SYMBOL NO.	PART NO.	DESCRIPTION
M055	*YFV5EB0037A3	MIC-LINE Connector Panel
M059	*YFXPL16A8WV	Filter Cover Stopper Pin
M070	*YFV5EA0038A1	Right Side Cover
M071	*YFV6GA0001B2	Sub Cover A for Right Side
M072	*YFV2VA0008A4	Dust Sheet
M073	*YFV6EA0002BS	Lid for Deflection Board
M074	*YFV2FA0023A4	Cushion A for Right Side Cover
M075	*YFV2FB0023A4	Cushion B for Right Side Cover
M076	*YFV1EA0005A4	Stopper Screw A for Cover (X6)
M077	*YFV1EA0004C4	Stopper Screw B for Lid (X2)
M078	*YFV1EB0005A4	Stopper Screw C for Cover (X2)
M079	*YFV4JA0017A4	Stopper Spring for Lid
M080	*YFV2EA0007B4	Guide Plate for Lid (X2)
M081 ⚠	*YFV7MA0021A4	Screw Caution Label
M082	*YFV7SA0064B4	Circuit Board Caution Label
M083	*YFV6GA0008A4	Mounting Plate for Socket
M084	*YFV5EA0039A4	Left Side Cover
M085	YFV6GA0002B2	Sub Cover B for Left Side
M086	*YFV6EA0003B3	Lid for Left Side Cover
M087	YFV2PA0015A4	Insulater Paper for High Voltage Board
M089	*YFV2PA0016A4	Insulator Paper for Diode

YFTV335H-1
OPTICAL MECHANISM

SYMBOL NO.	PART NO.	DESCRIPTION
PL001	*YF102K163432	Bais Light Lamp Ass'y for PL001 and CN17
CN17-PF	YF102K163432	2 pin Connecting Wire Ass'y for CN17 and PL001
M001	*YFV2KA0032BS	Front Chassis Ass'y
M091	*YF96A22348A0	Bayonet Mounting
M092	*YF47B1770970	Bayonet Mounting Lever
M093	*YF11A3242830	Filter Wheel Ass'y
M094	*YF12A1780850	Mounting Bracket for Bais Light
M095	*YF10A3256440	Coil Holder Ass'y
M096	*YF88A1780870	Adjustment Plate Ass'y

YFVPKP77701A
PROCESS-1 BOARD

SYMBOL NO.	PART NO.	DESCRIPTION		
PCB001	*YFVPKP77701A	Printed Circuit Board Assembly		
IC1	EHMS725W69S	IC		
IC2	NJM4556D	IC		
IC3	EHMS725W69S	IC		
IC4	AN610P	IC		
IC5	EHMS725W69S	IC		
IC6	AN610P	IC		
Q1	2SB641-RS	Transistor		
Q2	2SC641K-C	Transistor		
Q3	2SD661-TU	Transistor		
Q4,5	2SB641-RS	Transistor		
Q6	2SD636-RS	Transistor		
Q7	2SB641-RS	Transistor		
Q8, 10	2SD636-RS	Transistor		
Q11	2SD661-TU	Transistor		
Q12, 13	2SC641K-C	Transistor		
Q14	2SD661-TU	Transistor		
Q15, 16	2SB641-RS	Transistor		
Q17	2SD636-RS	Transistor		
Q18	2SB641-RS	Transistor		
Q19, 20	2SD636-RS	Transistor		
Q21	2SB641-RS	Transistor		
Q22	2SD636-RS	Transistor		
Q23	2SD661-TU	Transistor		
Q24,25	2SC641K-C	Transistor		
Q26	2SD661-TU	Transistor		
Q27, 28	2SB641-RS	Transistor		
Q29	2SD636-RS	Transistor		
Q30	2SB641-RS	Transistor		
Q31, 32	2SD636-RS	Transistor		
Q33	2SB641-RS	Transistor		
Q34	2SD636-RS	Transistor		
Q35	2SD661-TU	Transistor		
Q36	2SC641K-C	Transistor		
Q37~42	2SB641-RS	Transistor		
D7~9	MA165	Diode		
R1	ERD10TJ223	Carbon	22KΩ	1/8W
R2, 3	ERD10TJ103	Carbon	10KΩ	1/8W
R4	ERD10TJ473	Carbon	47KΩ	1/8W
R5	ERD10TJ223	Carbon	22KΩ	1/8W
R6	ERD10TJ472	Carbon	4.7KΩ	1/8W
R7	ERD10TJ332	Carbon	3.3KΩ	1/8W
R8	ERD10TJ223	Carbon	22KΩ	1/8W
R9	ERD10TJ563	Carbon	56KΩ	1/8W
R10, 11	ERO10CKF1501	Metal	1.5KΩ	1/8W
R12, 13	ERO10CKF5600	Metal	560Ω	1/8W
R14, 15	ERD10TJ273	Carbon	27KΩ	1/8W
R16	ERD10TJ104	Carbon	100KΩ	1/8W
R17	ERD10TJ472	Carbon	4.7KΩ	1/8W
R18	ERD10TJ223	Carbon	22KΩ	1/8W
R19	ERD10TJ682	Carbon	6.8KΩ	1/8W
R21	ERD10TJ222	Carbon	2.2KΩ	1/8W
R22	ERD10TJ821	Carbon	820Ω	1/8W
R25, 26	ERD10TJ332	Carbon	3.3KΩ	1/8W
R27	ERD10TJ562	Carbon	5.6KΩ	1/8W
R28	ERD10TJ682	Carbon	6.8KΩ	1/8W
R29	ERD10TJ332	Carbon	3.3KΩ	1/8W
R30	ERD10TJ681	Carbon	680Ω	1/8W
R31	ERO10CKF5601	Metal	5.6KΩ	1/8W
R32	ERO10CKF2701	Metal	2.7KΩ	1/8W
R33	ERD10TJ473	Carbon	47KΩ	1/8W
R34	ERD10TJ223	Carbon	22KΩ	1/8W
R35	ERD10TJ472	Carbon	4.7KΩ	1/8W
R36	ERD10TJ332	Carbon	3.3KΩ	1/8W
R37	ERD10TJ223	Carbon	22KΩ	1/8W
R38	ERD10TJ563	Carbon	56KΩ	1/8W
R39, 40	ERO10CKF5600	Metal	560Ω	1/8W
R41,42	ERO10CKF1501	Metal	1.5KΩ	1/8W
R43, 44	ERD10TJ273	Carbon	27KΩ	1/8W
R45	ERD10TJ472	Carbon	4.7KΩ	1/8W
R46	ERD10TJ103	Carbon	10KΩ	1/8W
R47	ERD10TJ332	Carbon	3.3KΩ	1/8W

SYM-BOL NO.	PART NO.	DESCRIPTION		
R48	ERD10TJ103	Carbon	10KΩ	1/8W
R49	ERD10TJ332	Carbon	3.3KΩ	1/8W
R50, 51	ERD10TJ681	Carbon	680Ω	1/8W
R52	ERD10TJ152	Carbon	1.5KΩ	1/8W
R53	ERD10TJ471	Carbon	470Ω	1/8W
R54	ERD10TJ562	Carbon	5.6KΩ	1/8W
R55	ERD10TJ223	Carbon	22KΩ	1/8W
R56	ERD10TJ562	Carbon	5.6KΩ	1/8W
R57	ERD10TJ221	Carbon	220Ω	1/8W
R58	ERD10TJ682	Carbon	6.8KΩ	1/8W
R59	ERD10TJ222	Carbon	2.2KΩ	1/8W
R60	ERD10TJ561	Carbon	560Ω	1/8W
R61	ERD10TJ471	Carbon	470Ω	1/8W
R62	ERD10TJ102	Carbon	1KΩ	1/8W
R63, 64	ERD10TJ332	Carbon	3.3KΩ	1/8W
R65	ERD10TJ562	Carbon	5.6KΩ	1/8W
R66	ERD10TJ682	Carbon	6.8KΩ	1/8W
R67	ERD10TJ332	Carbon	3.3KΩ	1/8W
R68	ERD10TJ681	Carbon	680Ω	1/8W
R70, 71	ERO10CKF1002	Metal	10KΩ	1/8W
R72	ERD10TJ473	Carbon	47KΩ	1/8W
R73	ERD10TJ223	Carbon	22KΩ	1/8W
R74	ERD10TJ472	Carbon	4.7KΩ	1/8W
R75	ERD10TJ332	Carbon	3.3KΩ	1/8W
R76	ERD10TJ223	Carbon	22KΩ	1/8W
R77	ERD10TJ563	Carbon	56KΩ	1/8W
R78, 79	ERO10CKF1501	Metal	1.5KΩ	1/8W
R80, 81	ERO10CKF5600	Metal	560Ω	1/8W
R82, 83	ERD10TJ273	Carbon	27KΩ	1/8W
R84	ERD10TJ472	Carbon	4.7KΩ	1/8W
R85	ERD10TJ103	Carbon	10KΩ	1/8W
R86	ERD10TJ332	Carbon	3.3KΩ	1/8W
R87	ERD10TJ152	Carbon	1.5KΩ	1/8W
R88, 89	ERD10TJ681	Carbon	680Ω	1/8W
R90	ERD10TJ471	Carbon	470Ω	1/8W
R91, 92	ERD10TJ562	Carbon	5.6KΩ	1/8W
R93	ERD10TJ223	Carbon	22KΩ	1/8W
R94	ERD10TJ472	Carbon	4.7KΩ	1/8W
R95	ERD10TJ221	Carbon	220Ω	1/8W
R96	ERD10TJ222	Carbon	2.2KΩ	1/8W
R97	ERD10TJ561	Carbon	560Ω	1/8W
R98	ERD10TJ471	Carbon	470Ω	1/8W
R99	ERD10TJ222	Carbon	2.2KΩ	1/8W
R100,101	ERD10TJ332	Carbon	3.3KΩ	1/8W
R102	ERD10TJ562	Carbon	5.6KΩ	1/8W
R103	ERD10TJ682	Carbon	6.8KΩ	1/8W
R104	ERD10TJ332	Carbon	3.3KΩ	1/8W
R105	ERD10TJ681	Carbon	680Ω	1/8W
R115~120	ERD10TJ273	Carbon	27KΩ	1/8W
R121	ERD10TJ683	Carbon	68KΩ	1/8W
VR1	YF6M9S5K	Variable Resistor		5KΩ
VR2	YF6M9S500	Variable Resistor		500Ω
VR3	YF6M9S5K	Variable Resistor		5KΩ
VR4	YF6M9S500	Variable Resistor		500Ω
VR5	YF6M9S5K	Variable Resistor		5KΩ
VR6	YF6M9S500	Variable Resistor		500Ω
C1	ECEA1AS470	Electrolytic	47μF	10V
C2	ECEA1HS010	Electrolytic	1μF	50V
C3	ECEA1AS101	Electrolytic	100μF	10V
C4	ECEA1AS470	Electrolytic	47μF	10V
C5	ECQV05473JZ	Plastic	0.047μF	50V
C6	ECQV05224JZ	Plastic	0.22μF	50V
C7~9	ECEA1AS470	Electrolytic	47μF	10V
C10,11	ECCF1H270JC	Ceramic	27pF	50V
C12	ECEA1AS470	Electrolytic	47μF	10V
C13	ECQV05224JZ	Plastic	0.22μF	50V
C14~17	ECEA1AS470	Electrolytic	47μF	10V
C18	ECEA1AS101	Electrolytic	100μF	10V
C19	ECEA1AS470	Electrolytic	47μF	10V
C20	ECQV05473JZ	Plastic	0.047μF	50V
C21	ECQV05224JZ	Plastic	0.22μF	50V
C22~24	ECEA1AS470	Electrolytic	47μF	10V
C25, 26	ECCF1H270JC	Ceramic	27pF	50V
C27, 28	ECEA1AS470	Electrolytic	47μF	10V
C29	ECEA1CS100	Electrolytic	10μF	16V
C30	ECEA1AS470	Electrolytic	47μF	10V
C31	ECQV05224JZ	Plastic	0.22μF	50V
C32	ECEA1CS220	Electrolytic	22μF	16V
C33~35	ECEA1AS470	Electrolytic	47μF	10V
C36	ECEA1AS101	Electrolytic	100μF	10V
C37	ECEA1AS470	Electrolytic	47μF	10V
C38	ECQV05473JZ	Plastic	0.047μF	50V
C39	ECQV05224JZ	Plastic	0.22μF	50V
C40~42	ECEA1AS470	Electrolytic	47μF	10V
C43,44	ECCF1H270JC	Ceramic	27pF	50V
C45	ECEA1AS470	Electrolytic	47μF	10V
C46	ECEA1CS100	Electrolytic	10μF	16V
C47	ECEA1AS470	Electrolytic	47μF	10V
C48	ECQV05224JZ	Plastic	0.22μF	50V
C49	ECEA1CS220	Electrolytic	22μF	16V
C50	ECEA1AS470	Electrolytic	47μF	10V
C60~65	ECEA1AS470	Electrolytic	47μF	10V
C66	ECEA1CN100S	Electrolytic	10μF	16V
C67	ECEA1AS101	Electrolytic	100μF	10V
C68	ECEA1CN100S	Electrolytic	10μF	16V
C69	ECEA1AS101	Electrolytic	100μF	10V
C71	ECKF1H561KB	Ceramic	560pF	50V
C72	ECCF1H470JC	Ceramic	47pF	50V
C73	ECCF1H390JC	Ceramic	39μF	50V
J106	ERD10T0T	Jamper Resistor		
CN1	YFPCN65PADS	Multi Connector		
CN2	YFPCN622PADS	Multi Connector		

YFVPKP777F1A
PROCESS-2 BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION
PCB002	*YFVPKP777F1A	Printed Circuit Board Assembly
IC1	EHMS935W73S	IC
IC2	EHMS831W74S	IC
IC3	AN614	IC
IC4	EHMS935W73S	IC
IC5	EHMS831W74SA	IC
IC6	EHMSU31W70S	IC
IC7	EHMS935W73S	IC
IC8	EHMS831W74SA	IC
IC9	AN608P	IC

SYM-BOL NO.	PART NO.	DESCRIPTION		
Q1	2SD636-RS	Transistor		
Q2	2SC641K-C	Transistor		
Q4	2SB641-QR	Transistor		
Q5, 6	2SC2377-CD	Transistor		
Q7, 8	2SD636-RS	Transistor		
Q9	2SC641K-C	Transistor		
Q10~12	2SD636-RS	Transistor		
Q13	2SC641K-C	Transistor		
Q14,15	2SD636-RS	Transistor		
Q16	2SC641K-2			
D1	MA26	Diode		
D2, 3	IS1925	Diode		
R2	ERD10TJ471	Carbon	470Ω	1/8W
R3	ERD10TJ472	Carbon	4.7KΩ	1/8W
R4	ERD10TJ122	Carbon	1.2KΩ	1/8W
R5	ERD10TJ103	Carbon	10KΩ	1/8W
R7	ERD10TJ102	Carbon	1KΩ	1/8W
R11	ERD10TJ471	Carbon	470Ω	1/8W
R12	ERD10TJ681	Carbon	680Ω	1/8W
R13	ERD10TJ272	Carbon	2.7KΩ	1/8W
R14	ERD10TJ221	Carbon	220Ω	1/8W
R15,16.	ERD10TJ391	Carbon	390Ω	1/8W
R17	ERD10TJ222	Carbon	2.2KΩ	1/8W
R18	ERD10TJ681	Carbon	680Ω	1/8W
R19	ERD10TJ472	Carbon	4.7KΩ	1/8W
R20	ERD10TJ562	Carbon	5.6KΩ	1/8W
R21	ERD10TJ182	Carbon	1.8KΩ	1/8W
R22	ERD10TJ472	Carbon	4.7KΩ	1/8W
R23	ERD10TJ332	Carbon	3.3KΩ	1/8W
R24	ERD10TJ471	Carbon	470Ω	1/8W
R25	ERD10TJ472	Carbon	4.7KΩ	1/8W
R26	ERD10TJ102	Carbon	1KΩ	1/8W
R27	ERD10TJ122	Carbon	1.2KΩ	1/8W
R28	ERD10TJ103	Carbon	10KΩ	1/8W
R30	ERD10TJ471	Carbon	470Ω	1/8W
R31	ERD10TJ561	Carbon	560Ω	1/8W
R33	ERD10TJ181	Carbon	180Ω	1/8W
R34, 35	ERD10TJ272	Carbon	2.7KΩ	1/8W
R36	ERD10TJ183	Carbon	18KΩ	1/8W
R37	ERD10TJ682	Carbon	6.8KΩ	1/8W
R38	ERD10TJ122	Carbon	1.2KΩ	1/8W
R39	ERD10TJ102	Carbon	1KΩ	1/8W
R40	ERD10TJ332	Carbon	3.3KΩ	1/8W
R41	ERD10TJ471	Carbon	470Ω	1/8W
R42	ERD10TJ122	Carbon	1.2KΩ	1/8W
R43	ERD10TJ472	Carbon	4.7KΩ	1/8W
R44	ERD10TJ102	Carbon	1KΩ	1/8W
R45	ERD10TJ103	Carbon	10KΩ	1/8W
R46	ERD10TJ332	Carbon	3.3KΩ	1/8W
R47	ERD10TJ472	Carbon	4.7KΩ	1/8W
R48,49	ERD10TJ103	Carbon	10KΩ	1/8W
R50	ERD10TJ333	Carbon	33KΩ	1/8W
R51	ERD10TJ222	Carbon	2.2KΩ	1/8W
R52	ERD10TJ101	Carbon	100Ω	1/8W
R53	ERD10TJ333	Carbon	33KΩ	1/8W
R54,55	ERO10CKF6800	Metal	680Ω	1/8W
R56	ERD10TJ102	Carbon	1KΩ	1/8W

SYM-BOL NO.	PART NO.	DESCRIPTION		
R57	ERD10TJ223	Carbon	22KΩ	1/8W
R58	ERD10TJ333	Carbon	33KΩ	1/8W
R59,60	ERO10CKF6800	Metal	680Ω	1/8W
R61	ERD10TJ102	Carbon	1KΩ	1/8W
R62	ERD10TJ223	Carbon	22KΩ	1/8W
R63	ERD10TJ333	Carbon	33KΩ	1/8W
R64	ERO10CKF4301	Metal	4.3KΩ	1/8W
R65	ERO10CKF1101	Metal	1.1KΩ	1/8W
R66	ERO10CKF3901	Metal	3.9KΩ	1/8W
R67	ERO10CKF1001	Metal	1KΩ	1/8W
R68	ERO10CKF22R0	Metal	22Ω	1/8W
R69	ERO10CKF18R0	Metal	18Ω	1/8W
R70	ERO10CKF56R0	Metal	56Ω	1/8W
R71, 72	ERO10CKF6800	Metal	680Ω	1/8W
R73	ERD10TJ102	Carbon	1KΩ	1/8W
R74	ERD10TJ223	Carbon	22KΩ	1/8W
R75	ERD10TJ333	Carbon	33KΩ	1/8W
R76	ERD10TJ102	Carbon	1KΩ	1/8W
R77	ERD10TJ562	Carbon	5.6KΩ	1/8W
R80	ERD10TJ102	Carbon	1KΩ	1/8W
R81~83	ERD10TJ823	Carbon	82KΩ	1/8W
R84	ERD10TJ223	Carbon	22KΩ	1/8W
R85	ERD10TJ682	Carbon	6.8KΩ	1/8W
VR1~3	YF6M9S1K	Variable Resistor	1KΩ	
VR4	YF6M9S2K	Variable Resistor	2KΩ	
VR5	YF6M9S10K	Variable Resistor	10KΩ	
VR6~8	YF6M9S1K	Variable Resistor	1KΩ	
VR9	YF6M9S2K	Variable Resistor	2KΩ	
VR10	YF6M9S500	Variable Resistor	500Ω	
VR11~14	YF6M9S1K	Variable Resistor	1KΩ	
VR15	YF6M9S2K	Variable Resistor	2KΩ	
VR16	YF6M9S1K	Variable Resistor	1KΩ	
VR17	YF6M9S2K	Variable Resistor	2KΩ	
Z1	YWLCF034	CRL Combination Component		
C1	ECEA1AS470	Electrolytic	47μF	10V
C2	ECCF1H180JC	Ceramic	18pF	50V
C3	ECQV05224JZ	Plastic	18pF	50V
C4	ECEA1CS100	Electrolytic	10μF	16V
C5, 6	ECEA1AS470	Electrolytic	47μF	10V
C7	ECQP1221JZ	Plastic	220pF	100V
C8	ECQP1681JZ	Plastic	680pF	100V
C9, 10	ECQP1472JZ	Plastic	4700pF	100V
C11	ECEA1AS470	Electrolytic	47μF	10V
C12, 13	ECQP1472JZ	Plastic	4700pF	100V
C14	ECCF1H050DC	Ceramic	5pF	50V
C15	ECQV05224JZ	Plastic	0.22μF	50V
C16	ECEA1CS100	Electrolytic	10μF	16V
C17~28	ECEA1AS470	Electrolytic	47μF	10V
C29	ECCF1H050DC	Ceramic	5pF	50V
C30	ECQV05224JZ	Plastic	0.22μF	50V
C31	ECEA1CS100	Electrolytic	10μF	16V
C32~34	ECEA1AS470	Electrolytic	47μF	10V
C36~40	ECEA1AS470	Electrolytic	47μF	10V
C41	ECCF1H220JC	Ceramic	22pF	50V
L1	YFL5270J	Coil	27μH	
L2	YFL5470J	Coil	47μH	
L3	YWL58R2J	Coil	8.2μH	
L4	EFDMN645A11A	Delay Line		

SYMBOL NO.	PART NO.	DESCRIPTION
L5	YFDL4623	Delay Line
L6	YFDL102A9007	Delay Line
L7	YFL5270J	Coil 27μH
T1	ELT7Q701B	Detection Transformer
J77,78	ERD10T	Jamper Resistor
CN1	YFPCN622PADS	Multi Connector

YFVPKP777F2A
ENCODER BOARD

SYMBOL NO.	PART NO.	DESCRIPTION
PCB003	*YFVPKP777F2A	Printed Circuit Board Assembly
IC1	HD14572UBP	IC
IC2	YWHD14516BP	IC
IC3	HD14053BP	IC
IC4,5	EHMSJ12H37S	IC
IC6,7	AN614	IC
IC8	YWMC14050BCP	IC
IC9	EHMS937H39S	IC
IC10	YHSNJM4558D	IC
IC11	TC4053BP	IC
IC12	HD14053BP	IC
IC13	EHMSU27H38S	IC
Q1~9	2SD636-RS	Transistor
Q10	2SC641K-C	Transistor
Q11	2SD636-RS	Transistor
Q12	2SD638-QR	Transistor
Q13	2SB643-QR	Transistor
Q14	2SC2377-CD	Transistor
Q15	2SC641K-C	Transistor
Q16	2SD636-RS	Transistor
Q17	2SC641K-C	Transistor
Q18	2SD636-RS-	Transistor
D1~5	MA165	
R1~3	ERD10TJ332	Carbon 3.3KΩ 1/8W
R4	ERD10TJ103	Carbon 10KΩ 1/8W
R5	ERD10TJ153	Carbon 15KΩ 1/8W
R6	ERD10TJ223	Carbon 22KΩ 1/8W
R7	ERO10CKF1002	Metal 10KΩ 1/8W
R8	ERO10CKF6200	Metal 620Ω 1/8W
R09	ERO10CKF1002	Metal 10KΩ 1/8W
R10	ERO10CKF6200	Metal 620Ω 1/8W
R11	ERO10CKF1002	Metal 10KΩ 1/8W
R12	ERO10CKF6200	Metal 620Ω 1/8W
R13	ERD10TJ222	Carbon 2.2KΩ 1/8W
R14,15	ERD10TJ182	Carbon 1.8KΩ 1/8W
R16	ERO10CKF2001	Metal 2KΩ 1/8W
R17	ERO10CKF1203	Metal 120KΩ 1/8W
R18	ERO10CKF1001	Metal 1KΩ 1/8W
R19	ERO10CKF5601	Metal 5.6KΩ 1/8W
R20	ERO10CKF1303	Metal 130KΩ 1/8W
R21	ERD10TJ182	Carbon 1.8KΩ 1/8W
R22	ERO10CKF1201	Metal 1.2KΩ 1/8W
R23	ERO10CKF1101	Metal 1.1KΩ 1/8W
R24	ERO10CKF10R0	Metal 10Ω 1/8W

SYMBOL NO.	PART NO.	DESCRIPTION
R25	ERO10CKF5601	Metal 5.6KΩ 1/8W
R26	ERO10CKF1000	Metal 100Ω 1/8W
R27	ERO10CKF5600	Metal 560Ω 1/8W
R28	ERO10CKF8200	Metal 820Ω 1/8W
R29	ERO10CKF1001	Metal 1KΩ 1/8W
R30	ERD10TJ272	Carbon 2.7KΩ 1/8W
R31	ERD10TJ221	Carbon 220Ω 1/8W
R32	ERD10TJ823	Carbon 82KΩ 1/8W
R33	ERD10TJ152	Carbon 1.5KΩ 1/8W
R34	ERO10CKF1501	Metal 1.5KΩ 1/8W
R35	ERO10CKF1800	Metal 180Ω 1/8W
R36,37	ERO10CKF3301	Metal 3.3KΩ 1/8W
R38	ERO10CKF5600	Metal 560Ω 1/8W
R39	ERO10CKF2201	Metal 2.2KΩ 1/8W
R40	ERO10CKF8200	Metal 820Ω 1/8W
R41	ERO10CKF1001	Metal 1KΩ 1/8W
R42	ERD10TJ332	Carbon 3.3KΩ 1/8W
R43	ERD10TJ823	Carbon 82KΩ 1/8W
R44	ERD10TJ152	Carbon 1.5KΩ 1/8W
R45	ERO10CKF2001	Metal 2KΩ 1/8W
R46,47	ERO10CKF1000	Metal 100Ω 1/8W
R48	ERO10CKF1001	Metal 1KΩ 1/8W
R49,50	ERD10TJ182	Carbon 1.8KΩ 1/8W
R51	ERD10TJ152	Carbon 1.5KΩ 1/8W
R52	ERD10TJ272	Carbon 2.7KΩ 1/8W
R53	ERD10TJ203	Carbon 20KΩ 1/8W
R54	ERD10TJ151	Carbon 150Ω 1/8W
R55	ERD10TJ102	Carbon 1KΩ 1/8W
R56	ERD10TJ562	Carbon 5.6KΩ 1/8W
R57	ERD10TJ101	Carbon 100Ω 1/8W
R58	ERD10TJ681	Carbon 680Ω 1/8W
R59	ERD10TJ222	Carbon 2.2KΩ 1/8W
R60,61	ERD10TJ273	Carbon 27KΩ 1/8W
R62	ERD10TJ271	Carbon 270Ω 1/8W
R63	ERD10TJ471	Carbon 470Ω 1/8W
R64	ERD10TJ681	Carbon 680Ω 1/8W
R65	ERD10TJ152	Carbon 1.5KΩ 1/8W
R66	ERD10TJ682	Carbon 6.8KΩ 1/8W
R67	ERD10TJ123	Carbon 12KΩ 1/8W
R68	ERD10TJ102	Carbon 1KΩ 1/8W
R69~71	ERO10CKF3002	Metal 30KΩ 1/8W
R72,73	ERO10CKF1001	Metal 1KΩ 1/8W
R74,75	ERO10CKF1002	Metal 10KΩ 1/8W
R76	ERD10TJ103	Carbon 10KΩ 1/8W
R77	ERD10TJ183	Carbon 18KΩ 1/8W
R80	ERD10TJ152	Carbon 1.5KΩ 1/8W
R81,82	ERD10TJ272	Carbon 2.7KΩ 1/8W
R83	ERD10TJ152	Carbon 1.5KΩ 1/8W
R84	ERD10TJ102	Carbon 1KΩ 1/8W
R85,86	ERD10TJ2R2	Carbon 2.2Ω 1/8W
R87	ERD10TJ103	Carbon 10KΩ 1/8W
R88,89	ERO10CKF1001	Metal 1KΩ 1/8W
R90	ERD10TJ223	Carbon 22KΩ 1/8W
R91	ERD10TJ472	Carbon 4.7KΩ 1/8W
R92	ERD10TJ392	Carbon 3.9KΩ 1/8W
R93	ERD10TJ222	Carbon 2.2KΩ 1/8W
R94	ERD10TJ272	Carbon 2.7KΩ 1/8W

SYM-BOL NO.	PART NO.	DESCRIPTION		
R95	ERD10TJ183	Carbon	18KΩ	1/8W
R96,97	ERD10TJ472	Carbon	4.7KΩ	1/8W
R98	ERD10TJ392	Carbon	3.9KΩ	1/8W
R99	ERD10TJ122	Carbon	1.2KΩ	1/8W
R100	ERD10TJ221	Carbon	220Ω	1/8W
VR1	YF6M9S10K	Variable Resistor	10KΩ	
VR2	YF6M9S500	Variable Resistor	500Ω	
VR3	YF6M9S50K	Variable Resistor	50KΩ	
VR4	YF6M9S500	Variable Resistor	500Ω	
VR5	YF6M9S1K	Variable Resistor	1KΩ	
VR6~9	YF6M9S200	Variable Resistor	200Ω	
VR10	YF6M9S100	Variable Resistor	100Ω	
VR11	YF6M9S5K	Variable Resistor	5KΩ	
VR12	YF6M9S50K	Variable Resistor	50KΩ	
VR13	YF6M9S200	Variable Resistor	20Ω	
VR14	YF6M9S1K	Variable Resistor	1KΩ	
C1~3	ECEAOJN330S	Electrolytic	33μF	6.3V
C4	ECKF1H222MD	Ceramic	2200pF	50V
C5	ECCF1H151J	Ceramic	150pF	50V
C6	ECKF1H222MD	Ceramic	2200pF	50V
C7	ECEA1AS470	Electrolytic	47μF	10V
C8	ECEA0JS101	Electrolytic	100μF	6.3V
C9	ECEA1AS101	Electrolytic	100μF	10V
C10~13	ECEA1AS470	Electrolytic	47μF	10V
C14	ECEA0JS101	Electrolytic	100μF	6.3V
C15	ECSF10E47	Electrolytic	47μF	10V
C16~19	ECKF1H222MD	Ceramic	2200pF	50V
C20	ECCF1H270J	Ceramic	27pF	50V
C21	ECCF1H330J	Ceramic	33pF	50V
C22	ECCF1H270J	Ceramic	27pF	50V
C23	ECKF1H222MD	Ceramic	2200pF	50V
C24	ECCF1H221JC	Ceramic	220pF	50V
C25	ECKF1H222MD	Ceramic	2200pF	50V
C26	ECSF10E47	Electrolytic	47μF	10V
C27	ECA1AS101	Electrolytic	100μF	10V
C28	ECCF1H820JC	Ceramic	82pF	50V
C29~31	ECEA1AS470	Electrolytic	47μF	10V
C32	ECCF1H390J	Ceramic	39pF	50V
C33	ECSF35ER1	Electrolytic	0.1μF	35V
C34	ECSF6E47	Electrolytic	47μF	6.3V
C35	ECKF1H222MD	Ceramic	2200pF	50V
C36	ECCF1H101K	Ceramic	100pF	50V
C38,39	ECEA1AS470	Electrolytic	47μF	10V
C40	ECEA1AS101	Electrolytic	100μF	10V
C41	ECEA1AS470	Electrolytic	47μF	10V
C42	ECEA0JSS102	Electrolytic	1000μF	6.3V
C43	ECQP1181JZ	Plastic	180pF	100V
C44	ECQV05473JZ	Plastic	0.047μF	50V
C45	ECEA1AS470	Electrolytic	47μF	10V
C46	ECCF1H121JC	Ceramic	120pF	50V
C47	ECCF1H180JC	Ceramic	18pF	50V
C48	ECQP1221JZ	Plastic	220pF	100V
C49	ECCF1H121JC	Ceramic	120pF	50V
C50	ECCF1H150JC	Ceramic	15pF	50V
C51	ECQP221JZ	Plastic	220pF	100V
L1	YFL5470J	Coil	47μH	
L2	YWL5220J	Coil	22μH	
L3	YFL5270J	Coil	27μH	

SYM-BOL NO.	PART NO.	DESCRIPTION		
L4	YWL5120J	Coil	12μH	
L5	YWL5100J	Coil	10μH	
L6	YFL5470J	Coil	47μH	
L7	YFDL4670	Delay Line	0.36μH	
SW1	YFSSS313	Slide Switch		
CF1	EFCA4R43MB3	Ceramic Filter	4.43MHz	
CN2	YFPCN622PADS	lti Connector		

YFVPKP77704A AUTO BOARD

PCB004	*YFVPKP77704A	Printed Circuit Board Assembly		
IC1	YWHD14001BP	IC		
IC2, 3	YHD14011BP	IC		
IC4	YWHD14040BP	IC		
IC5	AN6912	IC		
IC6	HA17902P	IC		
IC7	AN6913	IC		
IC8	HD14066BP	IC		
IC9, 10	YWHD14516BP	IC		
IC11,12	HD14066BP	IC		
IC13,14	YWHD14516BP	IC		
IC15,16	HD14066BP	IC		
IC17,18	YWHD14516BP	IC		
IC19,20	HD14066BP	IC		
IC21,22	YWHD14516BP	IC		
IC23,24	HD14066BP	IC		
IC25	HD14011BP	IC		
Q1	2SB641-RS	Transistor		
Q2~5	2SD636-RS	Transistor		
D1	YUDXZ068	Diode		6.8V
D2~4	MA165	Diode		
R1	ERD10TJ224	Carbon	220KΩ	1/8W
R2	ERD10TJ104	Carbon	100KΩ	1/8W
R3	ERD10TJ224	Carbon	220KΩ	1/8W
R4,5	ERD10TJ104	Carbon	100KΩ	1/8W
R6	ERD10TJ222	Carbon	2.2KΩ	1/8W
R7	ERO10CKF5601	Metal	5.6KΩ	1/8W
R8	ERO10CKF1502	Metal	15KΩ	1/8W
R9	ERO10CKF6801	Metal	6.8KΩ	1/8W
R10	ERO10CKF1002	Metal	10KΩ	1/8W
R11,12	ERD10TJ223	Carbon	22KΩ	1/8W
R13	ERD10TJ224	Carbon	220KΩ	1/8W
R14	ERD10TJ473	Carbon	47KΩ	1/8W
R15	ERD10TJ223	Carbon	22KΩ	1/8W
R16	ERD10TJ473	Carbon	47KΩ	1/8W
R17~19	ERD10TJ104	Carbon	100KΩ	1/8W
R20~22	ERD10TJ102	Carbon	1KΩ	1/8W
R23	ERD10TJ104	Carbon	100KΩ	1/8W
R24	ERD10TJ564	Carbon	560KΩ	1/8W
R25	ERD10TJ223	Carbon	22KΩ	1/8W
R26	ERD10TJ224	Carbon	220KΩ	1/8W
R27	ERD10TJ222	Carbon	2.2KΩ	1/8W
R28~31	ERD10TJ223	Carbon	22KΩ	1/8W
R32,33	ERO10CKF2003	Metal	200KΩ	1/8W
R34	ERD10TJ564	Carbon	560KΩ	1/8W

SYMBOL NO.	PART NO.	DESCRIPTION		
R35	ERD10TJ223	Carbon	22KΩ	1/8W
R36, 37	ERO10CKF2003	Metal	220KΩ	
R38	ERD10TJ224	Carbon	220KΩ	1/8W
Z1~4	EXBLD8104G	Block Resistor		
C1	ECEA1HS010	Electrolytic	1μF	50V
C2	ECQV05473JZ	Plastic	0.047μF	50V
C3	ECKF1H151KB	Ceramic	150pF	50V
C4	ECEA1AS101	Electrolytic	100μF	10V
C5	ECEA1AS470	Electrolytic	47μF	10V
C6~8	ECSF16E1	Electrolytic	1μF	16V
C9	ECQV05103JZ	Plastic	0.01μF	50V
C10, 11	ECQV05473JZ	Plastic	0.047μF	50V
C12	ECSF16E1	Electrolytic	1μF	16V
L1	YFL5470J	Coil	47μH	
CN1	YFPCN622PADS	Multi Connector		

YFVPKP777F3A
SYNC-1 BOARD

SYMBOL NO.	PART NO.	DESCRIPTION		
PCB005	*YFVPKP777F3A	Printed Circuit Board		
IC1	HD14011BP	IC		
IC2	YWHD14001BP	IC		
IC3	TC4538BP	IC		
IC4,5	YWHD14538BP	IC		
IC6	MN6065	IC		
IC7	AN614	IC		
IC8	HD14053BP	IC		
IC9	EHMS653C10S	IC		
Q1	2SD636-RS	Transistor		
Q2	2SB641-RS	Transistor		
Q3,4	2SD636-RS	Transistor		
Q5	2SB641-RS	Transistor		
Q7	2SC828-QR	Transistor		
Q8,9	2SB643-QR	Transistor		
Q10	2SB641-RS	Transistor		
Q11	2SD636-RS	Transistor		
D1,2	MA165	Diode		
D3	YUD1S2139C	Diode		
R1	ERD10TJ102	Carbon	1KΩ	1/8W
R2	ERD10TJ392	Carbon	3.9KΩ	1/8W
R3	ERD10TJ123	Carbon	12KΩ	1/8W
R4,5	ERD10TJ103	Carbon	10KΩ	1/8W
R6	ERO10CKF4702	Metal	47KΩ	1/8W
R7	ERD10TJ224	Carbon	220KΩ	1/8W
R8	ERD10TJ563	Carbon	56KΩ	1/8W
R9	ERD10TJ332	Carbon	3.3KΩ	1/8W
R10	ERD10TJ102	Carbon	1KΩ	1/8W
R11,12	ERO10CKF1802	Metal	18KΩ	1/8W
R13,14	ERO10CKF8201	Metal	8.2KΩ	1/8W
R15	ERD10TJ154	Carbon	150KΩ	1/8W
R16	ERO10CKF4702	Metal	47KΩ	1/8W
R17	ERO10CKF6802	Metal	68KΩ	1/8W
R18	ERD10TJ103	Carbon	10KΩ	1/8W
R19	ERD10TJ273	Carbon	27KΩ	1/8W
R20	ERD10TJ562	Carbon	5.6KΩ	1/8W
R21	ERD10TJ561	Carbon	560Ω	1/8W
R22	ERD10TJ101	Carbon	100Ω	1/8W
R23	ERD10TJ473	Carbon	47KΩ	1/8W
R24	ERD10TJ102	Carbon	1KΩ	1/8W
R25	ERD10TJ103	Carbon	10KΩ	1/8W
R26	ERD10TJ333	Carbon	33KΩ	1/8W
R27	ERD10TJ104	Carbon	100KΩ	1/8W
R28	ERD10TJ102	Carbon	1KΩ	1/8W
R29	ERD10TJ123	Carbon	12KΩ	1/8W
R30	ERD10TJ332	Carbon	3.3KΩ	1/8W
R31	ERD10TJ562	Carbon	5.6KΩ	1/8W
R32	ERD10TJ472	Carbon	4.7KΩ	1/8W
R33	ERD10TJ561	Carbon	560Ω	1/8W
R34	ERD10TJ223	Carbon	22KΩ	1/8W
R35	ERD10TJ331	Carbon	330Ω	1/8W
R36	ERD10TJ271	Carbon	270Ω	1/8W
R37,38	ERD10TJ101	Carbon	100Ω	1/8W
R39	ERD10TJ682	Carbon	6.8KΩ	1/8W
R40	ERD10TJ392	Carbon	3.9KΩ	1/8W
R41	ERD10TJ752	Carbon	75KΩ	1/8W
R42	ERD10TJ273	Carbon	27KΩ	1/8W
R43	ERD10TJ331	Carbon	330Ω	1/8W
R44	ERD10TJ561	Carbon	560Ω	1/8W
R45	ERD10TJ821	Carbon	820Ω	1/8W
R46	ERD10TJ103	Carbon	10KΩ	1/8W
R47	ERD10TJ123	Carbon	12KΩ	1/8W
R49	ERD10TJ332	Carbon	3.3KΩ	1/8W
VR1,2	YF6M9S5K	Variable Resistor	5KΩ	
VR3	YF6M9S500	Variable Resistor	500Ω	
VR4	YF6M9S5K	Variable Resistor	5KΩ	
VR5	YF6M9S20K	Variable Resistor	20KΩ	
C1	ECEA1AS101	Electrolytic	100μF	10V
C2,3	ECKF1H222MD	Ceramic	2200pF	50V
C4	ECQV05223JZ	Plastic	0.022μF	50V
C5	ECQP1102JZ	Plastic	1000pF	100V
C6	ECCF1H470JC	Ceramic	47pF	50V
C7	ECKF1H222MD	Ceramic	2200pF	50V
C8	ECCF1H470JC	Ceramic	47pF	50V
C9	ECQP1821JZ	Plastic	820pF	100V
C10	ECKF1H222MD	Ceramic	2200pF	50V
C11	ECQP1821JZ	Plastic	820pF	100V
C12	ECQP1221JZ	Plastic	220pF	100V
C13	ECQV05103JZ	Plastic	0.01μF	50V
C14	ECKF1H222MD	Ceramic	2200pF	50V
C15	ECQV05223JZ	Plastic	0.022μF	50V
C16	ECCF1H180JC	Ceramic	18pF	50V
C17	ECCF1H360JC	Ceramic	36pF	50V
C18	ECSF16E10	Electrolytic	10μF	16V
C19	ECCF1H150JC	Ceramic	15pF	50V
C20	ECKF1H222MD	Ceramic	2200pF	50V
C21	ECQP1271JZ	Plastic	270pF	100V
C22	ECCF1H470JC	Ceramic	47pF	50V
C23	ECKF1H101KB	Ceramic	100pF	50V
C24	ECQP1201JZ	Plastic	200pF	100V
C25	ECQP1102JZ	Plastic	1000pF	100V
C26	ECEA1CS100	Electrolytic	10μF	16V

SYM-BOL NO.	PART NO.	DESCRIPTION		
C27	ECCF1H222MD	Ceramic	22pF	50V
C28	ECKF1H222MD	Ceramic	2200pF	50V
C29	ECSF10E47	Electrolytic	47μF	10V
C30,31	ECKF1H222MD	Ceramic	2200pF	50V
C32	ECQV05103JZ	Plastic	0.01μF	50V
C33,34	ECKF1H222MD	Ceramic	2200pF	50V
C35	ECEA1AS470	Electrolytic	47μF	10V
C36	ECEA1CS100	Electrolytic	10μF	16V
C37	ECCF1H121JR	Ceramic	120pF	50V
C38	ECKF1H222MD	Ceramic	2200pF	50V
C39	ECSF10E47	Electrolytic	47μF	10V
C40	ECCF1H560J	Ceramic	56pF	50V
C41,42	ECKF1H222MD	Ceramic	2200pF	50V
CT1, 2	YFTZ03R300F	Trimmer	30pF	
L1, 2	YFL5470J	Coil	47μH	
L3	YWL5101J	Coil	100μH	
L4	YWL5120J	Coil	12μH	
L5	YFL5270J	Coil	27μH	
L6	YFL5470J	Coil	47μH	
SW1	YFSSS313	Slide Switch		
X1	YFKD1973X-A	Crystal Oscillator		8.86MHz
X2	YFHC33U2R5M	Crystal Oscillator		2.5MHz
J1, 2	ERD10T0T	Jamper Resistor		
CN1	ICS6412663	Socket		
CN1	YFPCN622PADS	Multi Connector		
M064	YFV2HA0072A4	Shield Parts		

YFVPKP777F4A
SYNC-2 BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION		
PCB006	YFVPKP777F4A	Printed Circuit Board		
IC1	HD14572UBP	IC		
IC2	YWHD14538BP	IC		
IC3	YWHD74LS00P	IC		
IC4	YWHD14538BP	IC		
IC5	AN-236	IC		
IC6	HD14046BP	IC		
IC7	YWHD14040BP	IC		
IC8	AN6913	IC		
IC9	HA17723G	IC		
Q1	2SD636-RS	Transistor		
Q2	2SB641-RS	Transistor		
Q3, 4	2SD636-RS	Transistor		
Q5~7	2SB641-RS	Transistor		
Q8, 9	2SC2377-CD	Transistor		
Q10, 11	2SB641-RS	Transistor		
Q12	2SD636-RS	Transistor		
Q13	2SB643-RS	Transistor		
Q14~16	2SD636-RS	Transistor		
Q17,18	2SK83-RS	Transistor		
Q19	2SB793-QR	Transistor		
D1	XZ045	Diode		
D2, 3	MA165	Diode		
D4	1S2687	Diode		
D5	XZ053	Diode		

SYM-BOL NO.	PART NO.	DESCRIPTION		
R1	ERD10TJ153	Carbon	15KΩ	1/8W
R2	ERD10TJ223	Carbon	22KΩ	1/8W
R4	ERD10TJ472	Carbon	4.7KΩ	1/8W
R5	ERD10TJ393	Carbon	39KΩ	1/8W
R6	ERD10TJ391	Carbon	390Ω	1/8W
R7	ERD10TJ182	Carbon	1.8KΩ	1/8W
R8	ERD10TJ472	Carbon	4.7KΩ	1/8W
R9	ERD10TJ222	Carbon	2.2KΩ	1/8W
R10	ERD10TJ332	Carbon	3.3KΩ	1/8W
R11	ERD10TJ392	Carbon	3.9KΩ	1/8W
R13	ERD10TJ562	Carbon	5.6KΩ	1/8W
R14	ERD10TJ104	Carbon	100KΩ	1/8W
R16	ERD10TJ562	Carbon	5.6KΩ	1/8W
R17	ERD10TJ103	Carbon	10KΩ	1/8W
R18	ERD10TJ104	Carbon	100KΩ	1/8W
R19	ERD10TJ103	Carbon	10KΩ	1/8W
R20	ERD10TJ393	Carbon	39KΩ	1/8W
R21	ERD10TJ103	Carbon	10KΩ	1/8W
R22	ERO10CKF1002	Metal	10KΩ	1/8W
R23	ERD10TJ100	Carbon	10Ω	1/8W
R24	ERD10TJ272	Carbon	2.7KΩ	1/8W
R25	ERD10TJ563	Carbon	56KΩ	1/8W
R26	ERD10TJ102	Carbon	1KΩ	1/8W
R27, 28	ERD10TJ562	Carbon	5.6KΩ	1/8W
R29	ERD10TJ222	Carbon	2.2KΩ	1/8W
R30	ERD10TJ272	Carbon	2.7KΩ	1/8W
R31	ERD10TJ102	Carbon	1KΩ	1/8W
R32~35	ERD10TJ562	Carbon	5.6KΩ	1/8W
R36	ERD10TJ822	Carbon	8.2KΩ	1/8W
R37	ERD10TJ332	Carbon	3.3KΩ	1/8W
R38, 39	ERD10TJ471	Carbon	470Ω	1/8W
R40	ERD10TJ122	Carbon	1.2KΩ	1/8W
R41	ERD10TJ123	Carbon	12KΩ	1/8W
R42	ERD10TJ122	Carbon	1.2KΩ	1/8W
R43	ERD10TJ471	Carbon	470Ω	1/8W
R44	ERD10TJ222	Carbon	2.2KΩ	1/8W
R45	ERD10TJ472	Carbon	4.7KΩ	1/8W
R46	ERD10TJ104	Carbon	100KΩ	1/8W
R47	ERD10TJ472	Carbon	4.7KΩ	1/8W
R48	ERD10TJ154	Carbon	150KΩ	1/8W
R49,50	ERO10CKF2202	Metal	22KΩ	1/8W
R51	ERD10TJ223	Carbon	22KΩ	1/8W
R52	ERD10TJ333	Carbon	33KΩ	1/8W
R53	ERD10TJ272	Carbon	2.7KΩ	1/8W
R54	ERD10TJ332	Carbon	3.3KΩ	1/8W
R55	ERD10TJ272	Carbon	2.7KΩ	1/8W
R56	ERD10TJ223	Carbon	22KΩ	1/8W
R57	ERD10TJ103	Carbon	10KΩ	1/8W
R58	ERD10TJ222	Carbon	2.2KΩ	1/8W
R59,60	ERD10TJ561	Carbon	560Ω	1/8W
R61	ERD10TJ103	Carbon	10KΩ	1/8W
R62	ERD10TJ181	Carbon	180Ω	1/8W
R63	ERD10TJ102	Carbon	1KΩ	1/8W
R64	ERD10TJ332	Carbon	3.3KΩ	1/8W
R65	ERD10TJ222	Carbon	2.2KΩ	1/8W
R66	ERD10TJ102	Carbon	1KΩ	1/8W

SYMBOL NO.	PART NO.	DESCRIPTION		
R67, 68	ERD10TJ103	Carbon	10KΩ	1/8W
R69	ERD10TJ104	Carbon	100KΩ	1/8W
R70	ERD10TJ333	Carbon	33KΩ	1/8W
R71, 72	ERD10TJ104	Carbon	100KΩ	1/8W
R73	ERD10TJ151	Carbon	150Ω	1/8W
R74	ERD10TJ152	Carbon	1.5KΩ	1/8W
R75	ERD10TJ393	Carbon	39KΩ	1/8W
R76	ERD10TJ332	Carbon	3.3KΩ	1/8W
R77	ERD10TJ101	Carbon	100Ω	1/8W
R78	ERD10TJ823	Carbon	82KΩ	1/8W
R79	ERD10TJ104	Carbon	100KΩ	1/8W
R80	ERD10TJ473	Carbon	47KΩ	1/8W
R81	ERD10TJ682	Carbon	6.8KΩ	1/8W
R82	ERD10TJ562	Carbon	5.6KΩ	1/8W
R83	ERO10CKF4700	Metal	470Ω	1/8W
R84	ERD10TJ331	Carbon	330Ω	1/8W
R85	ERO10CKF2700	Metal	270Ω	1/8W
R86	ERO10CKF1501	Metal	1.5KΩ	1/8W
R87	ERD10TJ152	Carbon	1.5KΩ	1/8W
VR1, 2	YF6M9S10K	Variable Resistor	10KΩ	
VR3	YF6M9S20K	Variable Resistor	20KΩ	
VR4	YF6M9S5K	Variable Resistor	5KΩ	
VR5	YF6M9S1K	Variable Resistor	1KΩ	
VR6	YF6M9S500	Variable Resistor	500Ω	
C1, 2	ECEA1AS470	Electrolytic	47µF	10V
C3	ECEA1AS470	Electrolytic	47µF	10V
C4	ECEA1ES4R7	Electrolytic	4.7µF	25V
C5	ECQP1102JZ	Plastic	1000pF	100V
C6	ECCF1H101JC	Ceramic	100pF	50V
C7	ECEA1CS100	Electrolytic	10µF	16V
C8	ECCF1H101JC	Ceramic	100pF	50V
C9	ECQ05183JZ	Plastic	0.018µF	50V
C10	ECEA0JS470	Electrolytic	47µF	6.3V
C11	ECCF1H820JC	Ceramic	82pF	50V
C12	ECEA1CS100	Electrolytic	10µF	16V
C13	ECEA1AS470	Electrolytic	47µF	10V
C14	ECCF1H470JC	Ceramic	47pF	50V
C15	ECCF1H151JC	Ceramic	150pF	50V
C16	ECEA1HS010	Electrolytic	1µF	50V
C17	ECSF10E47	Electrolytic	47µF	10V
C18	ECCF1H221JC	Ceramic	220pF	50V
C19, 20	ECQV05103JZ	Plastic	0.01µF	50V
C21	ECEA1CS100	Electrolytic	10µF	16V
C22	ECQV05103JZ	Plastic	0.01µF	50V
C23	ECQP1821JZ	Plastic	820pF	100V
C24	ECQV05103JZ	Plastic	0.01µF	50V
C25	ECCF1H220J	Ceramic	22pF	50V
C26	ECQV05103JZ	Plastic	0.01µF	50V
C27	ECCF1H470JC	Ceramic	47pF	50V
C28	ECKF1H222MD	Ceramic	2200pF	50V
C29~31	ECQV05103JZ	Plastic	0.01µF	50V
C32	ECKF1H222MD	Ceramic	2200pF	50V
C33	ECEA1HS3R3	Electrolytic	3.3µF	50V
C34	ECQV05103JZ	Plastic	0.01µF	50V
C35	ECEA1ES4R7	Electrolytic	4.7µF	25V
C36	ECCF1H270JC	Ceramic	27pF	50V
C37	ECCF1H560JC	Ceramic	56pF	50V
C38	ECCF1H220JC	Ceramic	22pF	50V
C39	ECSF10E47	Electrolytic	47µF	10V
C40	ECKF1H222MD	Ceramic	2200pF	50V
C41	ECEA1AS470	Electrolytic	47µF	10V
C42	ECQV05473JZ	Plastic	0.047µF	50V
C43	ECQP1332JZ	Plastic	3300pF	100V
C44	ECCF1H330JC	Ceramic	33pF	50V
C45	ECCF1H680JC	Ceramic	68pF	50V
C46	ECCF1H390JC	Ceramic	39pF	50V
C47	ECCF1H151JC	Ceramic	150pF	50V
C48	ECQP1102JZ	Plastic	1000pF	100V
C49	ECCF1H470JC	Ceramic	47pF	50V
C50	ECKF1H222MD	Ceramic	2200pF	50V
C51	ECSF10E47	Electrolytic	47µF	10V
C52	ECEA1CN100S	Electrolytic	10µF	16V
C53	ECKF1H221KB	Ceramic	220pF	50V
C54	ECSF10E1	Electrolytic	1µF	10V
C55	ECSF10E3R3	Electrolytic	3.3µF	10V
C56	ECKY1H102WE	Ceramic	1000pF	50V
CT1	ECV1ZW25X60	Trimmer Capacitor	25pF	
L1	YWL5150J	Coil	15µH	
L2	YFL5470J	Coil	47µH	
L3	YWL5560J	Coil	56µH	
L4	YWL5150J	Coil	15µH	
L5	YWL5560J	Coil	56µH	
X1	YWHC18U4R4M	Crystal Oscillator		4.43MHz
J3,12,15	ERD10T0T	Jamper Resistor		
CN1	YFPCN622PADS	Multi Connector		
M066	YFV2HA0070A4	Shield Base B		
M067	YFV2HA0071A4	Shield Case B		

YFVPKB0777FA
MOTHER BOARD

SYMBOL NO.	PART NO.	DESCRIPTION
PCB007	*YFVPKB0777FA	Printed Circuit Board Assembly
IC1,2	YFHD14053BP	IC
IC3	YFHD14011BP	IC
IC4,5	YWHD14052BP	IC
IC6,7	YFHD14053BP	IC
IC8,9	YHSNJM4558D	IC
IC10~12	EHMS111H40SA	IC
Q2~4	2SD636-RS	Transistor
Q5	2SD638-QR	Transistor
Q6,7	2SC2377-CD	Transistor
Q8	2SA1254-BC	Transistor
Q9	2SD636-RS	Transistor
Q10	2SD638-QR	Transistor
Q11	2SC2377-CD	Transistor
Q12	2SD636-RS	Transistor
Q13	2SD661-TU	Transistor
Q14,15	2SD636-RS	Transistor
Q16~18	2SD661-TU	Transistor
Q19~21	2SB641-RS	Transistor
Q22	2SD636-RS	Transistor
Q24	2SB641-RS	Transistor

SYM-BOL NO.	PART NO.	DESCRIPTION		
D2,3	MA165	Diode		
D5,8	MA165	Diode		
D9,10	YUDRM-1Z	Diode		
D11~13	MA165	Diode		
R1	ERD10TJ470	Carbon	47Ω	1/8W
R2	ERD10TJ564	Carbon	560KΩ	1/8W
R3	ERD10TJ473	Carbon	47KΩ	1/8W
R4~10	ERD10TJ564	Carbon	560KΩ	1/8W
R14	ERD10TJ122	Carbon	1.2KΩ	1/8W
R15	ERD10TJ821	Carbon	820Ω	1/8W
R16	ERD10TJ103	Carbon	10KΩ	1/8W
R17	ERD10TJ152	Carbon	1.5KΩ	1/8W
R18	ERD10TJ103	Carbon	10KΩ	1/8W
R19	ERD10TJ152	Carbon	1.5KΩ	1/8W
R20	ERD10TJ103	Carbon	10KΩ	1/8W
R21,22	ERO10CKF1801	Metal	1.8KΩ	1/8W
R23	ERO10CKF2701	Metal	2.7KΩ	1/8W
R24	ERD10TJ272	Carbon	2.7KΩ	1/8W
R25	ERD10TJ222	Carbon	2.2KΩ	1/8W
R26,27	ERO10CKF1801	Metal	1.8KΩ	1/8W
R28	ERO10CKF2701	Metal	2.7KΩ	1/8W
R29	ERD10TJ272	Carbon	2.7KΩ	1/8W
R30	ERD10TJ222	Carbon	2.2KΩ	1/8W
R31,32	ERD10TJ750	Carbon	75Ω	1/8W
R33	ERD10TJ222	Carbon	2.2KΩ	1/8W
R34	ERD10TJ122	Carbon	1.2KΩ	1/8W
R35	ERD10TJ102	Carbon	1KΩ	1/8W
R36	ERD10TJ152	Carbon	1.5KΩ	1/8W
R37	ERD10TJ222	Carbon	2.2KΩ	1/8W
R38	ERD10TJ332	Carbon	3.3KΩ	1/8W
R39, 40	ERD10TJ222	Carbon	2.2KΩ	1/8W
R41	ERD10TJ223	Carbon	22KΩ	1/8W
R42	ERD10TJ822	Carbon	8.2KΩ	1/8W
R43	ERD10TJ103	Carbon	10KΩ	1/8W
R44	ERD10TJ750	Carbon	75Ω	1/8W
R45	ERD10TJ152	Carbon	1.5KΩ	1/8W
R46	ERD10TJ361	Carbon	360Ω	1/8W
R47	ERD10TJ511	Carbon	510Ω	1/8W
R48	ERD10TJ332	Carbon	3.3KΩ	1/8W
R50,51	ERD10TJ564	Carbon	560KΩ	1/8W
R52	ERD10TJ472	Carbon	4.7KΩ	1/8W
R53	ERD10TJ103	Carbon	10KΩ	1/8W
R54	ERD10TJ303	Carbon	30KΩ	1/8W
R55	ERD10TJ153	Carbon	15KΩ	1/8W
R56	ERD10TJ223	Carbon	22KΩ	1/8W
R57	ERD10TJ102	Carbon	1KΩ	1/8W
R58	ERD10TJ680	Carbon	68Ω	1/8W
R59~61	ERD10TJ222	Carbon	2.2KΩ	1/8W
R62	ERD10TJ103	Carbon	10KΩ	1/8W
R63	ERD10TJ104	Carbon	100KΩ	1/8W
R64	ERD10TJ103	Carbon	10KΩ	1/8W
R65	ERD10TJ104	Carbon	100KΩ	1/8W
R66	ERD10TJ392	Carbon	3.9KΩ	1/8W
R67, 68	ERD10TJ223	Carbon	22KΩ	1/8W
R69	ERD10TJ182	Carbon	1.8KΩ	1/8W
R70	ERD10TJ103	Carbon	10KΩ	1/8W

SYM-BOL NO.	PART NO.	DESCRIPTION		
R71, 72	ERD10TJ564	Carbon	560KΩ	1/8W
R73	ERD10TJ393	Carbon	39KΩ	1/8W
R74	ERD10TJ274	Carbon	270KΩ	1/8W
R75	ERD25FJ561	Carbon	560Ω	1/8W
R76	ERD10TJ102	Carbon	1KΩ	1/8W
R78	ERD10TJ682	Carbon	6.8KΩ	1/8W
R80	ECQV05223JZ	Carbon	220KΩ	1/8W
R81	ERD10TJ223	Carbon	22KΩ	1/8W
R82, 83	ERD10TJ823	Carbon	82KΩ	1/8W
R84	ERD10TJ154	Carbon	150KΩ	1/8W
R85	ERD10TJ223	Carbon	22KΩ	1/8W
R86	ERD10TJ224	Carbon	220KΩ	1/8W
R87~92	ERD10TJ223	Carbon	22KΩ	1/8W
R93	ERD10TJ103	Carbon	10KΩ	1/8W
R94	ERD10TJ113	Carbon	11KΩ	1/8W
R95	ERD10TJ562	Carbon	5.6KΩ	1/8W
R96	ERD10TJ223	Carbon	22KΩ	1/8W
R97	ERD10TJ221	Carbon	220Ω	1/8W
R98	ERD10TJ561	Carbon	560Ω	1/8W
R99	ERD10TJ750	Carbon	75Ω	1/8W
R100	ERD10TJ562	Carbon	5.6KΩ	1/8W
R101	ERD10TJ223	Carbon	22KΩ	1/8W
R102	ERD10TJ221	Carbon	220Ω	1/8W
R103	ERD10TJ561	Carbon	560Ω	1/8W
R104	ERD10TJ750	Carbon	75Ω	1/8W
R105	ERD10TJ562	Carbon	5.6KΩ	1/8W
R106	ERD10TJ223	Carbon	22KΩ	1/8W
R107	ERD10TJ221	Carbon	220Ω	1/8W
R108	ERD10TJ561	Carbon	560Ω	1/8W
R109	ERD10TJ750	Carbon	75Ω	1/8W
R110	ERD10TJ153	Carbon	15KΩ	1/8W
R111	ERD10TJ273	Carbon	27KΩ	1/8W
R112	ERD10TJ132	Carbon	1.3KΩ	1/8W
R113	ERD10TJ102	Carbon	1KΩ	1/8W
R114	ERD10TJ153	Carbon	15KΩ	1/8W
R115	ERD10TJ154	Carbon	150KΩ	1/8W
R116	ERD10TJ332	Carbon	3.3KΩ	1/8W
R117	ERD10TJ102	Carbon	1KΩ	1/8W
R118	ERD10TJ152	Carbon	1.5KΩ	1/8W
R119	ERD10TJ272	Carbon	2.7KΩ	1/8W
R120	ERD10TJ152	Carbon	1.5KΩ	1/8W
R121	ERD10TJ104	Carbon	100KΩ	1/8W
R122	ERD10TJ103	Carbon	10KΩ	1/8W
R123	ERD10TJ750	Carbon	75Ω	1/8W
R130	ERD10TJ564	Carbon	560KΩ	1/8W
R131, 132	ERD10TJ103	Carbon	10KΩ	1/8W
VR1, 2	YF6M0S2K	Variable Resistor	2KΩ	
VR3, 5	YF6M0S5K	Variable Resistor	5KΩ	
VR6, 7	YWH00651A1K	Variable Resistor	1KΩ	
VR8,9	YWH0651A2R2K	Variable Resistor	2.2KΩ	
VR10	YWH0651A1K	Variable Resistor	1KΩ	
C1,2	ECQV05473JZ	Plastic	0.047μF	50V
C3,4	ECQV05563JZ	Plastic	0.056μF	50V
C5	ECQV05473JZ	Plastic	0.047μF	50V
C6,7	ECEA1AS470	Electrolytic	47μF	10V
C8	ECCF1H330JC	Ceramic	33pF	50V

SYMBOL NO.	PART NO.	DESCRIPTION		
C9,10	ECEA1AS470	Electrolytic	33μF	6.3V
C11	ECCF1H270JR	Ceramic	27pF	50V
C12	ECEA1AS101	Electrolytic	100μF	10V
C13,14	ECEA1AS470	Electrolytic	47μF	10V
C15,16	ECEA1CN100S	Electrolytic	10μF	16V
C17,18	ECEA1HS010	Electrolytic	1μF	50V
C19	ECEA1CN100S	Electrolytic	10μF	16V
C20	ECEA1ES331	Electrolytic	330μF	25V
C21	ECEA1CS330	Electrolytic	33μF	16V
C22,23	ECEA1AS470	Electrolytic	47μF	10V
C24	ECCF1H270JC	Ceramic	27pF	50V
C25,26	ECEA1AS470	Electrolytic	47μF	10V
C27	ECCF1H270JC	Ceramic	27pF	50V
C28,29	ECEA1AS470	Electrolytic	47μF	10V
C30	ECCF1H270JC	Ceramic	27pF	50V
C31,32	ECEA1AS470	Electrolytic	47μF	10V
C33	ECKF1H222MD	Ceramic	2200pF	50V
C34	ECEA1AS101	Electrolytic	100μF	10V
C35	ECKF1H152KB	Ceramic	1500pF	50V
C36,37	ECSF16E10	Electrolytic	10μF	16V
L1	YWLS-7470J	Coil	47μH	
SW1, 2	YFSSS212YK	Slide Switch		
F1 ⚠	YWTS5A	Current Fuse	5A	
CN1	YFICS6412623	Socket for IC		
CN1	YFPCN65SDS	Multi Connector for Circuit Board		
CN2,3	YFPCN622SDS	Multi Connector for Circuit Board		
CN5~8	YFPCN622SDS	Multi Connector for Circuit Board		
CN9	YF1CS6412603	Socket for IC		
CN11-JM~ 13-JM	EMCS0652M	6pin Jack Male		
CN14-JM	EMCS0452M	4 pin Jack Male		
CN15-JM	EMCS1052M	10 pin Jack Male		
CN16-JM	EMCS1252M	12 pin Jack Male		
CN17-JM	EMCS0352M	3 pin Jack Male		
CN18-JM	EMCS0252M	2 pin Jack Male		
CN19-JM	EMCS0452M	4 pin Jack Male		
CN20-JM	EMCS0352M	3 pin Jack Male		
CN21-JM	EMCS1052M	10 pin Jack Male		
CN22-JM	EMCS0252M	2 pin Jack Male		
CN23-JM	EMCS1352M	13 pin Jack Male		
CN24-JM	EMCS0952M	9 pin Jack Male		
CN1-PF	EMCM0936D45	9 pin Connector Wire Ass'y for CN1(EVF Socket) and BI3		
CN25~30	YFICS6412623	IC Socket for IC1, 2, 4~7		
CN31	YFICS6412613	IC Socket for IC3		
CN32, 33	YFICS6412603	IC Socket for IC3		
		IC Socket for IC8, 9		
BI1	EMCB0717B62V	7 pin Connecting Wire Ass'y for BI1 and CN016		
BI2	EMCC0717D42V	7 pin Connecting Wire Ass'y for BI2 and CN015		
BI3	EMCM0936D45V	9 pin Connecting Wire Ass'y for BI3 and CN1(EVF Socket)		
BI4	EMCM1025D42V	10 pin Connecting Wire Ass'y for BI4 and CN1(ALC Board)		
BI5	EMCM0622D45V	6 pin Connecting Wire Ass'y		
BI6	EMCM1016D45V	10 pin Connecting Wire Ass'y		
E1, 2	YWSN5053	Fuse Holder		
M088	YFV6GA0004B4	Mother Board Operation Panel		

YFVPKP77708A
PRE-PRE AMPLIFIER BOARD

SYMBOL NO.	PART NO.	DESCRIPTION		
PCB008	*YFVPKP77708A	Printed Circuit Board Assembly (X3)		
Q1	2SK321-QR	Transistor		
R1	ERD25FJ225	Carbon	2.2MΩ	1/4W
R2	ERD25FJ105	Carbon	1MΩ	1/4W
C1,2	YFFD12Y5V104	Ceramic	0.1μF	50V

YFVPKP777F6A
DEFECTION BOARD

SYMBOL NO.	PART NO.	DESCRIPTION		
PCB010	*YFVPKP777F6A	Printed Circuit Board Assembly		
IC1~10	NJM4556D	IC		
IC11,12	YWMC14053BCP	IC		
Q1~3	2SD636-RS	Transistor		
Q4	2SB641-RS	Transistor		
Q5	2SD638-QR	Transistor		
Q6	2SD959-PQ	Transistor		
Q7	2SC1567-QR	Transistor		
Q8	2SA564-RS	Transistor		
Q9	2SD636-RS	Transistor		
Q10	2SB641-RS	Transistor		
Q11	2SC828-RS	Transistor		
Q12	2SB641-RS	Transistor		
Q13	2SD636-RS	Transistor		
Q14,15	2SB641-RS	Transistor		
Q16	2SD636-RS	Transistor		
Q17,18	2SB641-RS	Transistor		
Q19-27	2SD636-RS	Transistor		
D1~10	MA165			
R1	ERD10TJ222	Carbon	2.2KΩ	1/8W
R2	ERD10TJ272	Carbon	2.7KΩ	1/8W
R3,4	ERD10TJ153	Carbon	15KΩ	1/8W
R5	ERD10TJ563	Carbon	56KΩ	1/8W
R6	ERD10TJ103	Carbon	10KΩ	1/8W
R7	ERD10TJ563	Carbon	56KΩ	1/8W
R8,9	ERD10TJ103	Carbon	10KΩ	1/8W
R10,11	ERO25CKF10R0	Metal	10Ω	1/4W
R12,13	ERO25CKF3300	Metal	330Ω	1/8W
R14~17	ERO25CKF10R0	Metal	10Ω	1/4W
R18	ERO25CKF3300	Metal	330Ω	1/8W
R19	ERD10TJ101	Carbon	100Ω	1/8W
R20	ERO10CKF6801	Metal	6.8KΩ	1/8W
R21~23	ERO10CKF3300	Metal	330Ω	1/8W
R24	ERD10TJ101	Carbon	100Ω	1/8W
R25,26	ERO10CKF6801	Metal	6.8KΩ	1/8W
R27	ERD10TJ101	Carbon	100Ω	1/8W
R28	ERO10CKF6801	Metal	6.8KΩ	1/8W
R29	ERD10TJ101	Carbon	100Ω	1/8W
R30	ERO10CKF6801	Metal	6.8KΩ	1/8W
R31	ERD10TJ101	Carbon	100Ω	1/8W

SYM-BOL NO.	PART NO.	DESCRIPTION		
R32	ERO10CKF6801	Metal	6.8KΩ	1/8W
R33	ERD10TJ101	Carbon	100Ω	1/8W
R34~36	ERD10TJ103	Carbon	10KΩ	1/8W
R37	ERD10TJ822	Carbon	8.2KΩ	1/8W
R38	ERD10TJ332	Carbon	3.3KΩ	1/8W
R39	ERD10TJ104	Carbon	100KΩ	1/8W
R40	ERD10TJ102	Carbon	1KΩ	1/8W
R41	ERD10TJ562	Carbon	5.6KΩ	1/8W
R42,43	ERD10TJ561	Carbon	560Ω	1/8W
R44,45	ERD10TJ472	Carbon	4.7KΩ	1/8W
R46~49	ERD10TJ102	Carbon	1KΩ	1/8W
R50	ERO10CKF1000	Metal	100Ω	1/8W
R51	ERO10CKF91R0	Metal	91Ω	1/8W
R52	ERO10CKF2201	Metal	2.2KΩ	1/8W
R53,54	ERD10TJ562	Carbon	5.6KΩ	1/8W
R55	ERO10CKF3301	Metal	3.3KΩ	1/8W
R56	ERO10CKF2703	Metal	270KΩ	1/8W
R57	ERO10CKF6801	Metal	6.8KΩ	1/8W
R58	ERO10CKF1000	Metal	100Ω	1/8W
R59	ERO10CKF2201	Metal	2.2KΩ	1/8W
R60	ERO10CKF91R0	Metal	91Ω	1/8W
R61,62	ERD10TJ562	Carbon	5.6KΩ	1/8W
R63	ERO10CKF3301	Metal	3.3KΩ	1/8W
R64	ERO10CKF2703	Metal	270KΩ	1/8W
R65	ERO10CKF6801	Metal	6.8KΩ	1/8W
R66	ERO10CKF91R0	Metal	91Ω	1/8W
R67	ERO10CKF1000	Metal	100Ω	1/8W
R68	ERO10CKF2201	Metal	2.2KΩ	1/8W
R69,70	ERD10TJ562	Carbon	5.6KΩ	1/8W
R71	ERO10CKF3301	Metal	3.3KΩ	1/8W
R72	ERO10CKF2703	Metal	270KΩ	1/8W
R73	ERO10CKF6801	Metal	6.8KΩ	1/8W
R74,75	ERD10TJ103	Carbon	10KΩ	1/8W
R76	ERO10CKF1502	Metal	15KΩ	1/8W
R77	ERO10CKF4701	Metal	4.7KΩ	1/8W
R78	ERO10CKF47R0	Metal	47Ω	1/8W
R79	ERO10CKF1001	Metal	1KΩ	1/8W
R80	ERD10TJ104	Carbon	100KΩ	1/8W
R81	ERD10TJ332	Carbon	3.3KΩ	1/8W
R82	ERD10TJ151	Carbon	150Ω	1/8W
R83	ERD10TJ393	Carbon	39KΩ	1/8W
R84,85	ERD10TJ222	Carbon	2.2KΩ	1/8W
R86,87	ERD10TJ152	Carbon	1.5KΩ	1/8W
R88,89	ERD10TJ223	Carbon	22KΩ	1/8W
R90	ERD10TJ103	Carbon	10KΩ	1/8W
R91	ERD10TJ332	Carbon	3.3KΩ	1/8W
R92	ERD10TJ681	Carbon	680Ω	1/8W
R93	ERD10TJ152	Carbon	1.5KΩ	1/8W
R94	ERD10TJ332	Carbon	3.3KΩ	1/8W
R95	ERD10TJ152	Carbon	1.5KΩ	1/8W
R96	ERD10TJ682	Carbon	6.8KΩ	1/8W
R97	ERD10TJ102	Carbon	1KΩ	1/8W
R98	ERD10TJ561	Carbon	560Ω	1/8W
R99	ERO10CKF2700	Metal	270Ω	1/8W
R100	ERO10CKF2002	Metal	20KΩ	1/8W
R101	ERO10CKF2202	Metal	22KΩ	1/8W
R102	ERO10CKF1202	Metal	12KΩ	1/8W
R103	ERO10CKF33R0	Metal	33Ω	1/8W
R104	ERO10CKF2201	Metal	2.2KΩ	1/8W
R105	ERO10CKF2700	Metal	270Ω	1/8W
R106	ERO10CKF2701	Metal	2.7KΩ	1/8W
R107	ERO10CKF1802	Metal	18KΩ	1/8W
R108	ERO10CKF1202	Metal	12KΩ	1/8W
R109	ERO10CKF2202	Metal	22KΩ	1/8W
R110	ERO10CKF33R0	Metal	33Ω	1/8W
R111	ERO10CKF2201	Metal	2.2KΩ	1/8W
R112	ERO10CKF2700	Metal	270Ω	1/8W
R113	ERO10CKF2701	Metal	2.7KΩ	1/8W
R114	ERO10CKF1802	Metal	18KΩ	1/8W
R115	ERO10CKF1202	Metal	12KΩ	1/8W
R116	ERO10CKF2202	Metal	22KΩ	1/8W
R117	ERO10CKF33R0	Metal	33Ω	1/8W
R118	ERO10CKF2201	Metal	2.2KΩ	1/8W
R119	ERO10CKF1502	Metal	15KΩ	1/8W
R120	ERO10CKF4701	Metal	4.7KΩ	1/8W
R121	ERO10CKF1001	Metal	1KΩ	1/8W
R122	ERO10CKF47R0	Metal	47Ω	1/8W
R123	ERO10CKF1502	Metal	15KΩ	1/8W
R124	ERO10CKF4701	Metal	4.7KΩ	1/8W
R125	ERO10CKF1001	Metal	1KΩ	1/8W
R126	ERO10CKF47R0	Metal	47Ω	1/8W
R127	ERD10TJ272	Carbon	2.7KΩ	1/8W
R128	ERD10TJ472	Carbon	4.7KΩ	1/8W
R129	ERD10TJ153	Carbon	15KΩ	1/8W
R130	ERD10TJ272	Carbon	2.7KΩ	1/8W
R131	ERD10TJ561	Carbon	560Ω	1/8W
R132	ERD10TJ473	Carbon	47KΩ	1/8W
R133	ERD10TJ682	Carbon	6.8KΩ	1/8W
R134	ERD10TJ222	Carbon	2.2KΩ	1/8W
R135,136	ERD10TJ103	Carbon	10KΩ	1/8W
R137	ERD10TJ332	Carbon	3.3KΩ	1/8W
R138	ERD10TJ103	Carbon	10KΩ	1/8W
R139	ERD10TJ152	Carbon	1.5KΩ	1/8W
R140	ERD10TJ332	Carbon	3.3KΩ	1/8W
R141	ERD10TJ472	Carbon	4.7KΩ	1/8W
R142	ERD10TJ473	Carbon	47KΩ	1/8W
R143	ERD10TJ682	Carbon	6.8KΩ	1/8W
R144	ERD10TJ222	Carbon	2.2KΩ	1/8W
R145,146	ERD10TJ103	Carbon	10KΩ	1/8W
R147	ERD10TJ332	Carbon	3.3KΩ	1/8W
R148	ERD10TJ103	Carbon	10KΩ	1/8W
R149	ERD10TJ152	Carbon	1.5KΩ	1/8W
R150	ERD10TJ332	Carbon	3.3KΩ	1/8W
R151	ERD10TJ472	Carbon	4.7KΩ	1/8W
R152	ERD10TJ473	Carbon	47KΩ	1/8W
R153	ERD10TJ682	Carbon	6.8KΩ	1/8W
R154	ERD10TJ222	Carbon	2.2KΩ	1/8W
R155,156	ERD10TJ103	Carbon	10KΩ	1/8W
R157	ERD10TJ332	Carbon	3.3KΩ	1/8W
R158	ERD10TJ103	Carbon	10KΩ	1/8W
R159	ERD10TJ152	Carbon	1.5KΩ	1/8W
R160	ERD10TJ332	Carbon	3.3KΩ	1/8W
R161	ERD10TJ472	Carbon	4.7KΩ	1/8W
R162~165	ERD10TJ222	Carbon	2.2KΩ	1/8W
VR1~6	YWH0621A10K	Variable Resistor	10KΩ	

SYM-BOL NO.	PART NO.	DESCRIPTION		
VR7	YF6M0S5K	Variable Resistor	5KΩ	
VR8	YF6M0S500	Variable Resistor	500Ω	
VR9	YF6M0S10K	Variable Resistor	10KΩ	
VR10	YF6M0S500	Variable Resistor	500Ω	
VR11	YF6M0S10K	Variable Resistor	10KΩ	
VR12	YF6M0S500	Variable Resistor	500Ω	
VR13~18	YF6M0S10K	Variable Resistor	10KΩ	
VR19~21	YF6M0S5K	Variable Resistor	5KΩ	
VR22,23	YF6M0S10K	Variable Resistor	10KΩ	
VR24~38	YWH0621A4R7K	Variable Resistor	4.7KΩ	
VR39~42	YF6M0S10K	Variable Resistor	10KΩ	
C1	ECEA1AS470	Electrolytic	47μF	10V
C2	ECEA1CS100	Electrolytic	10μF	16V
C3	ECQV05473JZ	Plastic	0.047μF	50V
C4	ECQP1102JZ	Plastic	1000pF	100V
C5	ECEA1ASS470	Electrolytic	47μF	10V
C6,7	ECSF25E1R5	Electrolytic	1.5μF	25V
C8	ECQM1H103JZ	Plastic	0.01μF	50V
C9	ECQP1102JZ	Plastic	1000pF	100V
C10	ECQM1H103JZ	Plastic	0.01μF	50V
C11	ECQP1102JZ	Plastic	1000pF	100V
C12	ECQM1H013JZ	Plastic	0.01μF	50V
C13	ECQP1102JZ	Plastic	1000pF	100V
C14	ECQM1H103JZ	Plastic	0.01μF	50V
C15	ECQP1102JZ	Plastic	1000pF	100V
C16	ECQM1H103JZ	Plastic	0.01μF	50V
C17	ECQP1102JZ	Plastic	1000pF	100V
C18	ECQM1H103JZ	Plastic	0.01μF	50V
C19	EZQP1102JZ	Plastic	1000pF	100V
C20	ECEA1AS470	Electrolytic	47μF	10V
C21	ECEA1HS010	Electrolytic	1μF	50V
C22	ECEA1AS470	Electrolytic	47μF	10V
C23	ECQP1472JZ	Plastic	4700pF	100V
C24	ECEA1CS100	Electrolytic	110μF	16V
C25	ECQP1272JZ	Plastic	2700pF	100V
C26~31	ECEA1AN220S	Electrolytic	22μF	10V
C32	ECQP1222JZ	Plastic	2200pF	100V
C33	ECQP1561JZ	Plastic	560pF	100V
C34	ECEA1AS470	Electrolytic	47μF	10V
C35	ECQP1222JZ	Plastic	2200pF	100V
C36	ECQP1561JZ	Plastic	560pF	100V
C37	ECQP1222JZ	Plastic	2200pF	100V
C38	ECAP1561JZ	Plastic	560pF	100V
C39	ECEA1AS470	Electrolytic	47μF	10V
C40	ECQM1H103JZ	Plastic	0.01μF	50V
C41	ECQV05104JZ	Plastic	0.1μF	50V
C42	ECEA1CS470	Electrolytic	47μF	16V
C43	ECEA1AS470	Electrolytic	47μF	10V
C44	ECEA1HS010	Electrolytic	1μF	50V
C45,46	ECSF16E3R3	Electrolytic	3.3μF	16V
C47,48	ECEA1AS470	Electrolytic	47μF	10V
C49,50	ECEA1AN220S	Electrolytic	22μF	10V
C51	ECSF16E3R3	Electrolytic	3.3μF	16V
C52~54	ECEA1AS470	Electrolytic	47μF	10V
C55,56	ECEA1AN220S	Electrolytic	22μF	10V
C57~59	ECEA1AS470	Electrolytic	47μF	10V

SYM-BOL NO.	PART NO.	DESCRIPTION		
C60	ECQP1182JZ	Plastic	1800pF	100V
C61	ECQV05104JZ	Plastic	0.1μF	50V
C62	ECQP1182JZ	Plastic	1800pF	100V
C63	ECQV05104JZ	Plastic	0.1μF	50V
C64	ECQP1182JZ	Plastic	1800pF	100V
C65,66	ECQV05104JZ	Plastic	0.1μF	50V
C67	ECQM1H103JZ	Plastic	0.01μF	50V
C68	ECQV05104JZ	Plastic	0.1μF	50V
C69	ECEA1AS470	Electrolytic	47μF	10V
C70	ECEA1CS100	Electrolytic	10μF	16V
C71	ECQV05273JZ	Plastic	0.027μF	50V
C72	ECQP1222JZ	Plastic	2200pF	100V
C73	ECEA1CS100	Electrolytic	10μF	16V
C74~76	ECEA1AS470	Electrolytic	47μF	10V
C77	ECKF1H102KB	Ceramic	1000pF	50V
C78,79	ECSF10E2R2	Electrolytic	2.2μF	10V
C80	ECQV05223JZ	Plastic	0.022μF	50V
C81~83	ECKF1H101KB	Ceramic	100pF	50V
L1	YWL10103JZ	Coil	10mH	
L2~4	YF3SL1	Coil	3SL-1	
L5~10	ELQ333D008J	Coil	33mH	
SW1,2	YWSSS322	Slide Switch		
CN1~3-JM	EMCS0952M	9 pin Jack Male		
CN4-JM	EMCS1052M	10 pin Jack Male		
CN5-JM	EMCS0452M	4 pin Jack Male		
CN2-PF	EMCM0210D65	2 pin Plug Female to Switch Board		
M060	YFV6GA0003C3	Deflection Operation Cover		
M061	YFV2SA0027A4	Mounting Angle for Cover		

YFVPKP77711A
SWITCH BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION		
PCB011	*YFVPKP77711A	Printed Circuit Board Assembly		
R1~6	ERD10TJ564	Carbon	560KΩ	1/8W
R7	ERD10TJ562	Carbon	5.6KΩ	1/8W
SW1,2	ESD14130	Slide Switch		
SW3,4	YFESD1495	Slide Switch		
CN1-JM	EMCS0651ML	6 pin Jack Male		
CN2-JM	EMCS0251ML	2 pin Jack Male		
M062	*YFV2SA0028A4	Mounting Angle for Switch Board		

YFVPKP77712A
HIGH VOLTAGE BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION
PCB012	*YFVPKP77712A	Printed Circuit Board Assembly
IC1	DN819	IC
IC2	EHMS727S40S	IC
IC3	EHMSU27W71S	IC
IC4	EHMSJ13W72	IC
Q1	2SB641-RS	Transistor
Q2	2SA684-RS	Transistor
Q3	2SC1384-RS	Transistor
Q4	2SD636-RS	Transistor
Q5	2SB641-RS	Transistor

SYM-BOL NO.	PART NO.	DESCRIPTION
Q6	2SD636-RS	Transistor
D1,2	MA150	Diode
D3~6	YUDERB12-02	Diode
D7,8	YUDSIR60	Diode
D9,10	YUDSIR150	Diode
D11~13	MA162	Diode
D14	YUD-XZ051	Diode
D15	MA150	Diode
R1	ERD10TJ153	Carbon 15KΩ 1/8W
R2	ERD10TJ102	Carbon 1KΩ 1/8W
R3	ERD10TJ222	Carbon 2.2KΩ 1/8W
R4, 5	ERD10TJ471	Carbon 470Ω 1/8W
R6	ERD10TJ332	Carbon 3.3KΩ 1/8W
R7	ERD10TJ102	Carbon 1KΩ 1/8W
R8	ERD10TJ561	Carbon 560Ω 1/8W
R9~11	ERD25TJ225	Carbon 2.2MΩ 1/4W
R12	ERD10TJ104	Carbon 100KΩ 1/8W
R13	YFGS14375FB	Metal 3.7MΩ 1/4W
R14	YFGS14325FB	Metal 3.2MΩ 1/4W
R15	YFGS14205FB	Metal 2MΩ 1/4W
R16	YFGS14105FB	Metal 1MΩ 1/4W
R17~19	ERD10TJ104	Carbon 100KΩ 1/8W
R20~22	ERD10TJ474	Carbon 470KΩ 1/8W
R25,26	ERD10TJ332	Carbon 3.3KΩ 1/8W
R27	ERD10TJ821	Carbon 820Ω 1/8W
R28	ERD10TJ473	Carbon 47KΩ 1/8W
R29	ERD10TJ682	Carbon 6.8KΩ 1/8W
R31,32	ERD10TJ474	Carbon 470KΩ 1/8W
R33	ERD10TJ563	Carbon 56KΩ 1/8W
R34	ERD10TJ103	Carbon 10KΩ 1/8W
VR1~3	YF6M0S1M	Variable Resistor 1MΩ
VR4~6	YF6M0S2M	Variable Resistor 2MΩ
VR7~9	YF6M0S10K	Variable Resistor 10KΩ
VR10	YF6M0S1K	Variable Resistor 1KΩ
VR11	YF6M0S500K	Variable Resistor 500KΩ
C1	ECEA1HS010	Electrolytic 1μF 50V
C2,3	ECEA1CS100	Electrolytic 10μF 16V
C4	ECEA1CS101	Electrolytic 100μF 16V
C5	ECKD3D821KB	Ceramic 820pF
C6	ECEA2ES010	Electrolytic 1μF 250V
C7	ECEA2WS010	Electrolytic 1μF 450V
C8	ECEA1CS101	Electrolytic 100μF 16V
C9,10	ECEA2AS100	Electrolytic 10μF 100V
C11~13	ECEA2AS010	Electrolytic 1μF 100V
C14	ECKD3D821KB	Ceramic 820pF 2KV
C15	ECQE12223MD	Plastic 0.022μF 1250V
C16	ECEA2AS010	Electrolytic 1μF 100V
C17~19	ECQE2104MS	Plastic 0.1μF 200V
C21~23	ECQM2332MZ	Plastic 0.0033μF 200V
C24	ECEA1AS101	Electrolytic 100μF 10V
C25,26	ECEA1CS101	Electrolytic 100μF 16V
C27	ECEA1CS470	Electrolytic 47μF 16V
C28	ECEA1CS101	Electrolytic 100μF 16V
C29	ECEA1AS470	Electrolytic 47μF 10V
C30	ECEA1HS4R7	Electrolytic 4.7μF 50V
C31	ECEA1HS010	Electrolytic 1μF 50V
C32	ECEA2ASR47	Electrolytic 0.47μF 100V

SYM-BOL NO.	PART NO.	DESCRIPTION
C36	ECEA1HSR47	Electrolytic 0.47μF 50V
C37	ECEA1HS010	Electrolytic 1μF 50V
C38	ECEA1HS4R7	Electrolytic 4.7μF 50V
C39	ECEA1CS470	Electrolytic 47μF 16V
C40~42	ECCF1H220JC	Ceramic 22pF 50V
C43	ECKF1H221KB	Ceramic 220pF 50V
L1	ELQ391D028	Coil
T1	YFVFT0006	Flyback Transformer
CN16-PF	EMCM1216D64W	12pin Plug Female to Mother Board
M056	*YFV2HA0034B4	Shield Case for High Voltage

YFVPKP77713A
TUBE SOCKET BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION
PCB013	*YFVPKP77713A	Printed Circuit Board Assembly (X3)
C1	ECQE12223MD	Plastic 0.022μF 1250V
CN001	YWS8-612J-02	Tube Socket

YFVPKC0777PA
AIC LENS BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION
PCB014	*YFVPKC0777PA	Printed Circuit Board Assembly
IC1	YFHD14053BP	IC
IC2, 3	YHSNJM4558D	IC
Q1	2SD636-RS	Transistor
Q2	2SD638-RS	Transistor
Q3	2SB641-RS	Transistor
D1	05Z2-7	Diode
D2~4	MA165	Diode
D5	YUD-XZ051	Diode
D6~8	MA165	Diode
R1	ERD10TJ564	Carbon 560KΩ 1/8W
R2	ERD10TJ152	Carbon 1.5KΩ 1/8W
R3	ERD10TJ224	Carbon 220KΩ 1/8W
R4	ERD10TJ562	Carbon 5.6KΩ 1/8W
R5	ERD10TJ682	Carbon 6.8KΩ 1/8W
R6	ERD10TJ684	Carbon 680KΩ 1/8W
R7	ERD25FJ562	Carbon 5.6KΩ 1/4W
R8	ERD10TJ103	Carbon 10KΩ 1/8W
R9,10	ERD10TJ512	Carbon 5.1KΩ 1/8W
R11	ERD10TJ103	Carbon 10KΩ 1/8W
R12	ERD10TJ272	Carbon 2.7KΩ 1/8W
R13	ERD10TJ512	Carbon 5.1KΩ 1/8W
R14	ERD10TJ274	Carbon 270KΩ 1/8W
R15	ERD10TJ303	Carbon 30KΩ 1/8W
R16	ERD10TJ102	Carbon 1KΩ 1/8W
R17	ERD10TJ153	Carbon 15KΩ 1/8W
R18	ERD10TJ104	Carbon 100KΩ 1/8W
R19,20	ERD10TJ682	Carbon 6.8KΩ 1/8W
R21	ERD10TJ473	Carbon 47KΩ 1/8W
R22	ERD10TJ104	Carbon 100KΩ 1/8W
R23	ERD10TJ101	Carbon 100Ω 1/8W
R24	ERD10TJ184	Carbon 180KΩ 1/8W
R25	ERD10TJ103	Carbon 10KΩ 1/8W
VR1	YWH0561A10K	Variable Resistor 10KΩ
C1	ECQV05103JZ	Plastic 0.01μF 50V

SYM-BOL NO.	PART NO.	DESCRIPTION
C2~4	ECEA1HN010S	Electrolytic 1μF 50V
C5	ECEA1EN4R7S	Electrolytic 4.7μF 25V
C6	ECEA1HN010S	Electrolytic 1μF 50V
C7	ECEA1CS221	Electrolytic 220μF 16V
CN1	EMCS1052M	10 pin Jack Male
CN2	EMCS0752M	7 pin Jack Male

YFVPKD0777PA
MIC BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION
PCB015	*YFVPKD0777PA	Printed Circuit Board Assembly
IC1, 2	YHSNJM4558D	IC
Q1	2SD636-RS	Transistor
D1, 2	MA165	Diode
R1	ERD10TJ621	Carbon 620Ω 1/8W
R2, 3	ERD10TJ104	Carbon 100KΩ 1/8W
R4	ERD10TJ621	Carbon 620Ω 1/8W
R5, 6	ERD10TJ104	Carbon 100KΩ 1/8W
R7, 8	ERD10TJ102	Carbon 1KΩ 1/8W
R9	ERD10TJ621	Carbon 620Ω 1/8W
R10, 11	ERD10TJ103	Carbon 10KΩ 1/8W
R12,13	ERD10TJ332	Carbon 3.3KΩ 1/8W
R14	ERD10TJ333	Carbon 33KΩ 1/8W
R15	ERD10TJ153	Carbon 15KΩ 1/8W
R16	ERD10TJ102	Carbon 1KΩ 1/8W
R17	ERD10TJ103	Carbon 10KΩ 1/8W
R18,19	ERD10TJ333	Carbon 33KΩ 1/8W
R20, 21	ERD10TJ104	Carbon 100KΩ 1/8W
R22	ERD10TJ333	Carbon 33KΩ 1/8W
R23	ERD10TJ473	Carbon 47KΩ 1/8W
R24	ERD10TJ101	Carbon 100Ω 1/8W
R25	ERD10TJ472	Carbon 4.7KΩ 1/8W
R26	ERD10TJ273	Carbon 27KΩ 1/8W
R27	ERD10TJ471	Carbon 470Ω 1/8W
C1~3	ECEA1CN100S	Electrolytic 10μF 16V
C4, 5	ECKF1H101KB	Ceramic 100pF 50V
C6, 7	ECKF1H681KB	Ceramic 680pF 50V
C8, 9	ECEA1CN100S	Electrolytic 10μF 16V
C10	ECKF1H681KB	Ceramic 680pF 50V
C11	ECEA1CN100S	Electrolytic 10μF 16V
C12	ECEA1AS101	Electrolytic 100μF 10V
C13, 14	ECKF1H101KB	Ceramic 100pF 50V
C15	ECEA1CN100S	Electrolytic 10μF 16V
C16, 17	ECKF1H681KB	Ceramic 680pF 50V
C18~20	ECEA1AS470	Electrolytic 47μF 10V
SW1	YWSSS322	Slide Switch
SW2	YFSSS312L4	Slide Switch
CN1-JM	EMCS0452M	4 pin Jack Male
CN2-JM	EMCS0352M	3 pin Jack Male
CN3-JM	EMCS0552M	5 pin Jack Male
CN4-JM	EMCS0252M	2 pin Jack Male
CN22-PF	EMCM0210D43Y	2 pin Plug Female (Mother Board)

YFVPKP77716A
MIC CONNECTION BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION
PCB016	*YFVPKP77716A	Printed Circuit Board Assembly
CN1-JM	EMCS0352	3 pin Plug Female

YFVPKP77717B
INTERCOM BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION
PCB017	*YFVPKP77717B	Printed Circuit Board Assembly
VR001	EVJKYAS10B23	Variable Resistor

YFVPKP77718B
EVF SOCKET BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION
PCB018	*YFVPKP77718B	Printed Circuit Board Assembly
CN2-JM	EMCS0951ML	9 pin Jack Male
CN012	YFDECF9SF0	9 pin Aduptor Connector

YFVPKP77719A
BATTERY BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION
PCB019	*YFVPKP77719A	Printed Circuit Board
M014	*YFV4JA0023B4	Battery Spring

YFVPKP77721A PREAMPLIFIER BOARD-Blue
YFVPKP77722A PREAMPLIFIER BOARD-Green
YFVPKP77723A PREAMPLIFIER BOARD-Red

SYM-BOL NO.	PART NO.	DESCRIPTION
PCB021	*YFVPKP77721A	Printed Circuit Board Assembly for Blue
PCB022	*YFVPKP77722A	Printed Circuit Board Assembly for Green
PCB023	*YFVPKP77723A	Printed Circuit Board Assembly for Red
IC1	AN608P	IC
Q1	2SA1254-BC	Transistor
R1	ERD10TJ681	Carbon 680Ω 1/8W
R2	ERD10TJ472	Carbon 4.7KΩ 1/8W
R3, 4	ERD10TJ153	Carbon 15KΩ 1/8W
R5	ERD10TJ392	Carbon 3.9KΩ 1/8W
R6	ERD10TJ562	Carbon 5.6KΩ 1/8W
R7	ERD10TJ472	Carbon 4.7KΩ 1/8W
R8	ERD10TJ104	Carbon 100KΩ 1/8W
R9	ERD10TJ100	Carbon 10Ω 1/8W
C1	ECSF6E22	Electrolytic 22μF 6.3V
C2	ECSF16E15	Electrolytic 15μF 16V
C3	ECSF10E22	Electrolytic 22μF 10V
C4	ECSF16E15	Electrolytic 15μF 16V
CT1	ECV1ZW25X60	Trimmer Capacitor 25pF
CN11-PF	EMCM0616B62X	6 pin Connecting Wire Ass'y for Preamplifier-Blue
CN12-PF	EMCM0613B62X	6 pin Connecting Wire Ass'y for Preamplifier-Green
CN13-PF	EMCM0638B62X	6 pin Connecting Wire Ass'y for Preamplifier-Red
M057	*YFV2HA0039A4	Shield Case (X3)

ACCESSORY PARTS/PACKAGING PARTS

SYMBOL NO.	PART NO.	DESCRIPTION
PCB101	YFVPKP77751A	Extension Board 1 Ass'y
PCB102	YFVPKP77752A	Extension Board 2 Ass'y
BAT101	SR44BARA	Ni-CD Battery (X2)
BAT102	UM-3DEP	Battery (X3)
E101	YF14A-10B	VTR Cable
M101	WN-0003	Mounting Cap
M102	YFV8QA0157AN	Operating Instruction
M103	YFVQA0120-2	Warranty Card
M104	YW-B-RB01	Service Center List
M105	YFV8RA0011A3	Window Chart
M106	YWV2300RB02	Color Chart
M107	YFV8NA0005AN	Rain Coat
M108	XZB55X71C1	Polyethylene Bag for Camera
M109	XZB26X40C05	Polyethylene Bag for Accessory
M110	YWT10X16C03	Polyethylene Bag for Extension Board 1
M111	YWT10X10C03	Polyethylene Bag for Extension Board 2
M112	YWT100X120X1	Polyethylene Bag for Carrying Case
M113	YW10X35C03	Polyethylene Bag for Microphone
M114	YFWV-CC30P	Carrying Case
M115	YFV9CA0185AN	Packaging Case

WV-LZ30/12 ZOOM LENS

MISCELLANEOUS

SYMBOL NO.	PART NO.	DESCRIPTION
E120	YF106306	8 pin Lens Cable and Connector
M121	YF121654	Lens Food
M122	YF121658	Lens Cap
M123	YF121657	Rear Cap
M124	YF616129	Zoom Lever
M125	YF121688	Macro Knob
M126	YF616139	Spring for Macro Knob
M127	YFN173025	Screw A for Zoom Lever
M128	YF108022	Grip Band Ass'y
M129	YF108021	Mounting Plate for Grip Band
M130	YFN209030	Screw B for Grip Band
M131	YF102251	Iris Motor Limit Plate A
M132	YF102252	Iris Motor Limit Plate B
M133	YFN202530	Screw C for Iris Motor Limit Plate
M134	YF102253	Spring Washer
M135	YF113023	Connector Cap
M136	YFV7QA0117A4	Main Label

ACCESSORY PARTS/PACKAGING PARTS

SYMBOL NO.	PART NO.	DESCRIPTION
M140	*YFVQA0120-2	Warranty Card
M141	YWS-EULRB01C	Lens Service Center List
M142	YWT20X35C03	Polyethylene Bag for Warranty Card
M145	YFV9CA0124AN	Packaging Case

WV-MC30P MICROPHONE

MISCELLANEOUS

SYMBOL NO.	PART NO.	DESCRIPTION
M150	YPM-MQ449AA	Wind-Screen
M151	YPM-MCA33AAS	Mic Case A
M152	YPM-HK759ABS	Mic Case B
M153	YFMC30B0DY-K	Mic Assembly
M154	YPM-EB030AA	3 pin Connector
M155	YWM-0461	Mic Unit

PACKAGING PARTS

SYMBOL NO.	PART NO.	DESCRIPTION
M156	YPM-PN766AS	Packaging Case

WV-PS30/ABCG AC ADAPTOR

MISCELLANEOUS

SYMBOL NO.	PART NO.	DESCRIPTION
E001	YWKPLTSA-8	AC Power Cord for WV-PS30/A
	YWHBS-3-08	AC Power Cord for WV-PS30/B
	YWCE0099-08F	AC Power Cord for WV-PS30/C
	YWVM0099-08	AC Power Cord for WV-PS30/G
F1	YWTS1A	Fuse
CN001	YFDECF9SF0	9 pin Socket
M161	*YFV5KA0013B2	Case
M162	*YFV2CA0016A4	Hold Plate for Slider
M163	*YFV6JA0009A4	Slide Knob
M164	*YFV7SA0061A4	Lock Indicator Label
M165	*YFV6JA0010A4	Push Knob
M166	*YFV1BA0002A4	Slider Support
M167	*YFV4JA0024C4	Coil Spring for Slider
M168	*YFV5EA0045C2	Bottom Cover
M169	*YFV2SA0036A4	Mounting Plate for Connector
M170	*YFV1HA0008A4	Guide Pin
M171	*YFV2SA0035B4	Cord Clamp Mounting Plate
M172	YWSR6W-1	Cord Clamp
M173 ⚠	*YFV7QA0184A4	Main Label
M174 ⚠	*YFV7SA0023A4	Caution Label
M175 ⚠	YVZC700RB50	Serial No. Label
M177	YW-BCG-UR01B	Earth Label
M178	YW-BCG-EM01	Lug

MRM173
AC ADAPTOR BOARD

SYMBOL NO.	PART NO.	DESCRIPTION
PCB001	*YF3EF9720-3	Printed Circuit Board Assembly
IC1	TLP531GR	Integrated Circuit
Q1	2SC2655-Y	Transistor
Q2	2SC945-PQ	Transistor
Q3	2SA1020-Y	Transistor
Q4	2SC2792	Transistor
Q5, 6	2SC945-PQ	Transistor
CR1	KBPC606	Diode
CR2	RGP10K	Diode
CR4	IS954	Diode

SYM-BOL NO.		PART NO.	DESCRIPTION		
CR5		RD4.7EB2	Diode		
CR6,7		IS954	Diode		
CR8		RD4.7EB2	Diode		
CR9		ESAB82-004	Diode		
CR10		RD5.1EB2	Diode		
R1		ERF5AK3R3	Wire Wound	3.3Ω	5W
R2		ERD25FJ684	Carbon	680KΩ	1/4W
R3		ERD50FJ124	Carbon	120KΩ	1/2W
R4		ERD50FJ100	Carbon	10Ω	1/2W
R5		ERD25FJ330	Carbon	33Ω	1/4W
R6		ERD25FJ3R3	Carbon	3.3Ω	1/4W
R8		ERD25FJ220	Carbon	22Ω	1/4W
R9		ERD25FJ221	Carbon	220Ω	1/4W
R10, 11		ERD25FJ102	Carbon	1KΩ	1/4W
R12		ERD25FJ471	Carbon	470Ω	1/4W
R13		ERD25FJ390	Carbon	39Ω	1/4W
R14		ERX1ANJR82	Metal	0.82Ω	1W
R16		ERD25FJ2R2	Carbon	2.2Ω	1/4W
R17		ERD25FJ562	Carbon	5.6KΩ	1/4W
R19		ERD25FJ182	Carbon	1.8KΩ	1/4W
R20		ERD25FJ101	Carbon	100Ω	1/4W
R21		ERD25FJ471	Carbon	470	1/4W
R22~24		ERD25FJ102	Carbon	1K	1/4W
R18		YFH0621A2R2K	Variable Resistor	2.2KΩ	
C1		YFMMS2B104M	Film	0.1μF	125V
C2~5		YFAL-7	Ceramic	1000pF	125V
C6		YFMMS2B104M	Ceramic	0.1μF	125V
C7, 8		YFAL-7	Ceramic	1000pF	125V
C9		YF400VBSN47	Electrolytic	47μF	400V
C10		ECQM6102KZ	Plastic	1000pF	600V
C11		YFAMR2G103K	Plastic	0.01μF	400V
C12		YF45B3A221KY	Ceramic	220pF	1KV
C13		ECQV05153JZ	Plastic	0.015μF	50V
C14		ECEA1ES101	Electrolytic	100μF	25V
C15,16		ECEA1ES681	Electrolytic	680μF	25V
C17		ECEA1ES331	Electrolytic	330μF	25V
C18		ECQV05104JZ	Plastic	0.1μF	50V
L1		YFUF103Y0R5	Choke Coil		
L2, 3		YFRH52X9X170	Bead Ferp		
L4		YFCH166	Choke Coil		
L5		YFCH365	Choke Coil		
T1	△	YFMT729	Transformer		
F1	△	YFT-2A	Fuse 2A		
E1		YFH-0011-1	Fuse Holder (X2)		
CN1		YF4EF9965	Terminal Block A		
CN2		YFP77-2P	Terminal Block B		

ACCESSORY PARTS/PACKAGING

M180	YFV8QA0158AN	Operating Instruction
M182	YW-B-RB01	Warranty Card
M183	YWT20X35C03	Polyethylene Bag for AC Adaptor and Power Cord
M184	YFV9CA0139AN	Packaging Case

WV-VF30F 1.5" VIEWFINDER

MISCELLANEOUS

SYM-BOL NO.		PART NO.	DESCRIPTION
V101	△	40CB4M	Cathode Ray Tube
L101	△	ELY15V109B	Deflection Coil Ass'y for L101 and CN3
CN101		YFS7506P610	CRT Socket Ass'y
CN2-PF		YFS7506P610	6 pin Connecting Wire Ass'y for CN2 and CN101
CN3-PF		ELY15V109B	4 pin Connecting Wire Assy for CN3 and CN101
M201		*YFV5KB0004A2	CRT Upper Case
M202		*YFV5WB0005A4	CRT Panel
M203		YFV4JA0002A4	Spring Plate for Mirro
M204		YFV1UA0001A4	Mirro
M205		*YFV5KB0003A2	CRT Lower Case
M206		YFV1CA0001B4	Stop Ring for Lens
M207		YFV1VA0001A4	Lens
M208		YFV1CA0002B4	Stop Spring
M209		YFV3FA0001A3	Cap Ring for Lens
M210		YFV5GA0001A3	Eye Cap
M211		YWV3804WM02	Earth Leaf Spring
M212		YFV2FA0007A4	CRT Cushion
M213		YVZC604WB01	Rubber Neck for CRT
M214		YFV3FA0002A3	Ring for Case Fixed
M220		*YFV5WA0044AS	VF Upper Case Ass'y
M222		*YFV5WA0043AS	VF Lower Case Ass'y
M223		*YFV2CA0013A3	Mounting Bracket for Circuit Board
M224		*YFV5MA0003B3	Mounting Shoe for VF
M225		*YFV7QA0190A4	Main Label
M226		YVZC700RB50	Serial No. Label
M228		YWS-CULRB12	Screw Caution Label
M239		YWS-WULRB03	High Voltage Caution Label

YFVPKBVF30PA DEFLECTION BOARD

PCB001	*YFVPKBVF30PA	Printed Circuit Board Assembly
IC1	AN2510	IC
IC2	NJM4558M	IC
Q1	2SB641-RS	Transistor
Q2	2SD636-RS	Transistor
Q3	2SB641-RS	Transistor
Q4	2SB638-RS	Transistor
Q5	2SB642	Transistor
Q6	2SD1257A-Q	Transistor
Q7~10	2SD601-QRS	Transistor
Q11	2SA1096-QRS	Transistor
Q12~14	2SD1205-R	Transistor
D1~4	MA165	Diode
D5	MA26	Diode
D6	MA165	Diode
D7, 8	MA26	Diode
D9	MA165	Diode

SYMBOL NO.	PART NO.	DESCRIPTION
D10	YFXZ059	Diode
R1	ERO10CKF5101	Metal 5.1KΩ 1/8W
R2	ERD10TJ4R7	Carbon 4.7Ω 1/8W
R3	ERO10CKF6202	Metal 62KΩ 1/8W
R4	ERO10CKF3001	Metal 3KΩ 1/8W
R5	ERO10CKF5601	Metal 5.6KΩ 1/8W
R6	ERD10TJ751	Carbon 750Ω 1/8W
R7	ERD10TJ752	Carbon 7.5KΩ 1/8W
R8	ERD10TJ162	Carbon 1.6KΩ 1/8W
R9	ERD10TJ822	Carbon 8.2KΩ 1/8W
R10	ERD10TJ361	Carbon 360Ω 1/8W
R11	ERD10TJ432	Carbon 4.3KΩ 1/8W
R12	ERD10TJ362	Carbon 3.6KΩ 1/8W
R13	ERD10TJ152	Carbon 1.5KΩ 1/8W
R15	ERD10TJ470	Carbon 47Ω 1/8W
R16	ERD10TJ821	Carbon 820Ω 1/8W
R17	ERD10TJ511	Carbon 510Ω 1/8W
R18	ERD10TJ240	Carbon 24Ω 1/8W
R19	ERD10TJ472	Carbon 4.7KΩ 1/8W
R20	ERD10TJ105	Carbon 1MΩ 1/8W
R21	ERD10TJ623	Carbon 62KΩ 1/8W
R22	ERD10TJ104	Carbon 100KΩ 1/8W
R23	ERD10TJ162	Carbon 1.6KΩ 1/8W
R24	ERD10TJ222	Carbon 2.2KΩ 1/8W
R25	ERD25FJ225	Carbon 2.2MΩ 1/4W
R26	ERD10TJ394	Carbon 390KΩ 1/8W
R27	ERD25FJ105	Carbon 1MΩ 1/4W
R28	ERD10TJ563	Carbon 56KΩ 1/8W
R29	ERD10TJ123	Carbon 12KΩ 1/8W
R30	ERD10TJ512	Carbon 5.1KΩ 1/8W
R31	ERD10TJ103	Carbon 10KΩ 1/8W
R32	ERD10TJ242	Carbon 2.4KΩ 1/8W
R33	ERD10TJ331	Carbon 330Ω 1/8W
R34	ERD10TJ102	Carbon 1KΩ 1/8W
R35	ERD10TJ681	Carbon 680Ω 1/8W
R36	ERD10TJ473	Carbon 47KΩ 1/8W
R37	ERD10TJ102	Carbon 1KΩ 1/8W
R38	ERD10TJ151	Carbon 150Ω 1/8W
R39	ERD10TJ102	Carbon 1KΩ 1/8W
R40	ERD10TJ364	Carbon 360KΩ 1/8W
R41	ERD10TJ821	Carbon 820Ω 1/8W
R42	ERD10TJ563	Carbon 56KΩ 1/8W
R43	ERD10TJ202	Carbon 2KΩ 1/8W
R44	ERD10TJ563	Carbon 56KΩ 1/8W
R45	ERD10TJ751	Carbon 750Ω 1/8W
R46	ERD10TJ103	Carbon 10KΩ 1/8W
R47	ERD10TJ153	Carbon 15KΩ 1/8W
R48	ERD10TJ200	Carbon 20Ω 1/8W
VR1	YF6M0S1K	Variable Resistor 1KΩ
VR2	YF6M0S5K	Variable Resistor 5KΩ
VR3	YF6M0S500	Variable Resistor 500Ω
VR4	EVJ8KAS10B23	Variable Resistor for Contrast 2KΩ
VR5	EVJ8KAS10B25	Variable Resistor for Bright 200KΩ
VR6	YF6M2S2M	Variable Resistor 2MΩ
VR7	YF6M2S1K	Variable Resistor 1KΩ
VR8	YF6M9S100	Variable Resistor 100Ω
C1	ECEA1HN2R2S	Electrolytic 2.2μF 50V
C2	ECEA0JSS471	Electrolytic 470μF 6.3V
C3	ECQP1911JZ	Plastic 910pF 100V
C4	ECQV05824JZ	Plastic 0.82μF 50V
C5	ECEA0JS470	Electrolytic 47μF 6.3V
C6	ECCF1H221J	Ceramic 220pF 50V
C7	ECEA0JSS471	Electrolytic 470μF 6.3V
C8	ECQV05223JZ	Plastic 0.022μF 50V
C9	ECEA1CS100	Electrolytic 10μF 16V
C10	ECQP1152JZ	Plastic 1500pF 100V
C11,12	ECEA0JS470	Electrolytic 47μF 6.3V
C13	ECCF1H181J	Ceramic 180pF 50V
C14	ECKF1H271KB	Ceramic 270pF 50V
C15	ECQV05823JZ	Plastic 0.082μF 50V
C16	ECEA2AS2R2	Electrolytic 2.2μF 100V
C17	ECEA0JS470	Electrolytic 47μF 6.3V
C18	ECEA1AS470	Electrolytic 47μF 10V
C19 △	ECQM2562JZ	Plastic 5600pF 200V
C20	ECEA1ASS221	Electrolytic 220μF 10V
C21, 22	ECKD3A102KB	Ceramic 1000pF 1KV
C23	ECKD2H102KB	Ceramic 1000pF 500V
C24, 25	ECEA1AS470	Electrolytic 47μF 10V
C26	ECEA1HNR47S	Electrolytic 0.47μF 50V
C27	ECEA1AS470	Electrolytic 47μF 10V
C28	ECEA1HNR47S	Electrolytic 0.47μF 50V
C29	ECQV05224JZ	Plastic 0.22μF 50V
L2	ELQ101D036J	Coil 100μH
L3 △	YFPM210UHK	Coil 210μH
L4 △	YFUD10A250UH	Coil 250μH
T1 △	YFFTVF30	Flyback Transformer
SW1, 2	YFA-12HV	Toggle Switch
J1	EMCWCEA441KH	Jamper
CN1	YFDEC9PF0	9 pin Socket
CN2-JM	EMCS0652M	6 pin Jack Male
CN3-JM	EMCS0450Z	4 pin Jack Male

YFVPKQVF30PB
TALLY LAMP BOARD

PCB002	*YFVPKQVF30PB	Printed Circuit Board Assembly
D100	LT9010D	Tally Lamp
R100	ERD25FJ181	Carbon 180Ω 1/4W
M221	YFV5EA0005A4	Tally Lamp Cover

YFVPKRVF30PB
LED BOARD

PCB003	*YFVPKRVF30PB	Printed Circuit Board Assembly
D101	LN33SGP-U	LED (Green)
D102	LN23SRP-D	LED (Red)
D103	LN43SYP	LED (Yellow)
M215	YFV3CA0001A4	LED Holder

ACCESSORY PARTS/PACKAGING PARTS

SYM-BOL NO.	PART NO.	DESCRIPTION
M230	* YFV8QA0165AN	Operating Instruction
M231	YW-B-RB01	Warranty Card
M233	YWT20X35C03	Polyethylene Bag for operating Instruction
M234	XZB26X40C05	Polyethylene Bag for VF
M235	* YFV9CA0121AN	Packaging Case

WV-PS36F BATTERY PACK

MISCELLANEOUS

SYM-BOL NO.	PART NO.	DESCRIPTION
CN001	YFDECF9SF0	9 pin Connector
CN002	YWQMA1221B	DC Socket
BAT001	P4010A19	Storage Battery
M251	* YFV5EA0074A3	Upper Cover
M252	* YFV5KA0019A2	Battery Case
M253	* YFV2SA0059A3	Bottom Cover
M254	* YFV5EA0045C2	Bottom Case
M255	* YFV1BA0002A4	Mounting Bracket
M256	* YFV6JA0010A4	Push Button
M257	* YFV6JA0009A4	Slide Button
M258	* YFV2CA0016A4	Push Plate
M259	* YFV4JA0024C4	Spring
M260	* YFV2SA0036A4	Mounting Bracket for 9p Connector
M261	* YFV2PA0025A4	Insulator Paper (X2)
M262	* YFV1KA0007A4	Polyethylene Washer
M263	* YFEDS2	Cord Clamp
M264	* YFV2FA0030A4	Battery Cushion A
M265	* YFV2FA0031A4	Battery Cushion B (X3)
M266 ⚠	* YFV7QA0183A4	Main Label A
M267 ⚠	* YVZC700RB50	Serial No. Label
M268	* YFV1HA0008A4	Guide Pin
M269	* YFV7SA0061A4	Cock Indicator Label

ACCESSORY PARTS/PACKAGING PARTS

SYM-BOL NO.	PART NO.	DESCRIPTION
M272	XZB26X40C05	Polyethylene Bag for WV-PS36
M273	YFV9CA0120AN	Packaging Case

WV-Q35 TRIPOD MOUNTING ADAPTOR

MISCELLANEOUS

SYM-BOL NO.	PART NO.	DESCRIPTION
M301	* YFV2TA0009B3	Upper Mounting Bracket
M302	* YFV2TA0010B3	Bottom Mounting Bracket
M303	* YFV2CA0014A4	Mounting Plate
M304	* YFV2EA0004B4	Front Stand
M305	* YFV2EA0005B4	Right Guide
M306	* YFV2EA0006B4	Left Guide
M307	* YFV2NA0012A4	Protecter Shiel A
M308	* YFV2NA0013A4	Protecter Shiel B
M309	* YFV4JA0018B4	Stopper Spring
M310	YFV2NA0004B4	Lock Spacer
M311	YFV4RA0003B4	Mounting Lever
M312	YFV1EA0006B4	Support Bracket for Lever
M313	YFV2TA0011A4	Mounting Angle
M314	YFV4JA0019B4	Spring
M315	YFV1KA0004A4	Polyethylene Washer
M316	YWV52-BM01	Mounting Screw A
M317	YFV1EA0009A4	Mounting Screw B
M318	* YFV7QA0116A4	Main Label
M319	YVZC700RB50	Serial No. Label
M320	* YFV7SA0045A4	Lock Label

ACCESSORY PARTS/PACKAGING PARTS

SYM-BOL NO.	PART NO.	DESCRIPTION
M330	XZB26X40C05	Polyethylene Bag
M331	YFV9CA0123AN	Packaging Case

WV-BC30/ABCG BATTERY CHARGER

MISCELLANEOUS

SYM-BOL NO.	PART NO.	DESCRIPTION
T401	YFPHB48E007	Power Transformer
F401	YFXB2C063TR0	Fuse 63mA
E401	YFV0009-005	Charge Cable
E402	YWKPLTSA-8	AC Power Cord for WV-BC30/A
	YWHBS-3-08	AC Power Cord for WV-BC30/B
	YWCE099-08F	AC Power Cord for WV-BC30/C
	YWVM0099-08	AC Power Cord for WV-BC30/G
E403	YWX-N1153-07	Fuse Holder
M401	* YFV5EA0073A3	Upper Cover
M402	* YFV2KA0036A3	Chassis
M403	* YFV2SA0058A4	Mounting Angle
M404	* YFV5LA0001A4	Rubber Foot
M405	YFV2PA0024A4	Insulator Paper for Fuse
M406 ⚠	* YFV7QA0185A4	Main Label
⚠	* YFV7QA0203A4	
M407 ⚠	* YFV7SA0052A4	Caution Label
M408 ⚠	* YFV7SA0068A4	Fuse Label

SYMBOL NO.	PART NO.	DESCRIPTION
M409 ⚠	YVZC700RB50	Serial No. Label
M410	YWBCGUR01B YWS-CCSRB01	L.N Earth Label
M411	YWS-CULRB12	Cover Caution Label for WV-BC30 Cover Caution Label for WV-BC30/
M412	YWSR2P4	Charge Cord Clamp
M413	YWSR5N4	Power Cord Clamp
M414	YW-BCG-EM01	Earth Lag

YFVPKPBC30PA CHARGER BOARD

SYMBOL NO.	PART NO.	DESCRIPTION
PCB401	*YFVPKPBC30PA	Printed Circuit Board Assembly
D1	RB152	Rectifier
D2	LN21RPH	LED
R1	ERD25FJ821	Carbon 820Ω 1/4W
R2	ERX3ANJ2R7	Metal 2.7Ω 3W
E1	YVL437TM027	Terminal
M415	YWE6400FR09	LED Holder

ACCESSORY PARTS/PACKAGING PARTS

SYMBOL NO.	PART NO.	DESCRIPTION
M420	*YFV8QA0114AN	Operating Instruction
M421	YWV22XPRB99H	Service Center List
M422	YFVQA0120-2 YFVQA0054-4	Warranty Card for WV-BC30 Warranty Card for WV-BC30/Canada
M423	XZB26X40C05	Polyethylene Bag for Operating Instruction
M424	TWT20X35C03	Polyethylene Bag for Battery Charger
M429	YFV9CA0134AN	Packaging Case

WV-VF35F 5" VIEWFINDER

MISCELLANEOUS

SYMBOL NO.	PART NO.	DESCRIPTION
V1 ⚠	140BRB4	Cathode Ray Tube
VR1	EVHC0AK15B53	Variable Resistor 5KΩ
VR2	EVHC0AK15B15	Variable Resistor 100KΩ
L501 ⚠	YS-32971	Deflection Coil Ass'y
SW1, 2	YFM2012ESG	Change Over Switch for Peaking and Tally
PL1	YWS9G1012V12	Pilot Lamp
E501	YWKPLTSA-8 YWHHS-3-08 YWCE099-08F YWVC0099-08	AC Power Cord for WV-VF35F/A AC Power Cord WV-35F/B AC Power Cord for WV-VF35C/C AC Power Cord for WV-VF35F/G
CN10	YWM20201A	Tally Lamp Socket
CN13	YWS7-502B-40	CRT Socket Ass'y
CN11-PF	YFVCN0064A	7 pin Connecting Wire Ass'y for CN11 and E501
CN4-PF	EMCM0513D52S	5 pin Plug Female
CN7-PF	EMCM0313DG3S	3 pin Plug Female to Deflection Board
CN8-PF	EMCM0211D55	2 pin Plug Female to Deflection Board
M501	*YFV5EA0063A3	Upper Cover
M502	YWV3805CM01	Printed Board Chassis A
M503	YWV5200WM01	CRT Stopper Band
M504	YWV3805AM01	Mounting Bracket for CRT (X2)
M505	YWV3805DR01	Rear Escutcheon
M506	YWV3805LM02	Rear Nut Plate (X2)
M507	YWV930-LM01	Reinforce Plate
M508	YWV385PKR01V	Tally Cover
M509	YWV385PLR01U	Tally Card
M510	YWV3805AM02	Reflection Plate for Tally
M511	*YFV5EA0067A2	Front Cover
M512	YWV3805CM02	Printed Board Chassis B
M513	*YFV5EA0064A2	Lower Cover
M514	*YFV1KA0001A4	Polyethylene Washer
M515	*YFV5WA0060A3	Control Panel
M517	YWV3801HR01	Control Knob (X2)
M518	YWSR6W-1	Cord Clamp
M519	*YFV7QA0111A4	Main Label
M520	YVZC700RB50	Serial No. Label
M521	YFV7SA0023A4	Screw Caution Label
M522	YWV3805UR02	CRT Indicator Label
M523	YWS-LM010A	Panasonic Badge
M524	*YFBE-40	Stop Ring Washer (X3)
M525	*YFV2CA0019A4	Mounting Frame Push Plate
M526	*YFV2NA0009A4	Mounting Frame Spacer (X2)
M527	*YFV2TA0012A4	Mounting Bracket
M528	*YFV2NA0008A4	Spacer for Frame (X3)
M529	*YFV2WA0004A3	Upper Mount Frame
M530	*YFV2WA0005A3	Lower Mounting Frame
M531	*YFV5RA0014A4	Knob for Pan Bracket (X2)
M532	*YFV5RA0015A3	Knob for Tilt Bracket
M533	YWV1800FR03	Polyethylene Washer
M534	*YFV1BA0003A4	Support for Frame (X2)
M535	*YFV1BA0004A4	Support for Mount Bracket
M545	YWS-WULRB04	Serviceman Caution Label
M546	*YFV7MA0017A4	High Voltage Caution Label

YFVPKB0035FA V/F DEFLECTION BOARD

SYMBOL NO.	PART NO.	DESCRIPTION
PCB501	*YFVPKB0035FA	Printed Circuit Board Assembly
IC200	YHSNJM4558D	IC
IC202	AN5750	IC
Q100	2SD636-RS	Transistor
Q101	2SB641-RS	Transistor
Q102	2SD636-RS	Transistor
Q103	2SC1226-QR	Transistor
Q104	2SA684-QR	Transistor

SYMBOL NO.	PART NO.	DESCRIPTION		
Q200,201	2SD636-RS	Transistor		
Q202	2SB641-RS	Transistor		
Q203	2SD636-RS	Transistor		
Q206	2SD772B	Transistor		
Q207,208	2SD1205-R	Transistor		
Q209	2SB793-QR	Transistor		
Q210	2SA838-BC	Transistor		
D100,101	MA161	Diode		
D200,202	MA165	Diode		
D204	MA165	Diode		
D206	YUDXZ068	Diode		6.8V
D207	YUDERB24-04C	Diode		
D208	YUDU06C	Diode		
D209	0A91	Diode		
D210~212	YUDERB24-04C	Diode		
TH100	ERTD2FHL503S	Thermistor	50KΩ	
R100	ERD10TJ472	Carbon	4.7KΩ	1/8W
R101	ERD10TJ103	Carbon	10KΩ	1/8W
R102	ERD10TJ222	Carbon	2.2KΩ	1/8W
R103	ERD25FJ270	Carbon	27Ω	1/4W
R104	ERX1ANJR68	Metal	0.68Ω	1W
R105	ERD10TJ621	Carbon	620Ω	1/8W
R106	ERD10TJ103	Carbon	10KΩ	1/8W
R107	ERD25FJ332	Carbon	3.3KΩ	1/4W
R108	ERD25FJ681	Carbon	680Ω	1/4W
R109	ERD25FJ820	Carbon	82Ω	1/4W
R110	ERD25FJ222	Carbon	2.2KΩ	1/4W
R111	ERD25FJ470	Carbon	47Ω	1/4W
R112	ERD25FJ122	Carbon	1.2KΩ	1/4W
R113	ERD25FJ331	Carbon	330Ω	1/4W
R114	ERD25FJ121	Carbon	120Ω	1/4W
R115,116	ERX2ANJR56	Metal	0.56Ω	2W
R200	ERD10TJ563	Carbon	56KΩ	1/8W
R201	ERD10TJ104	Carbon	100KΩ	1/8W
R202	ERD10TJ472	Carbon	4.7KΩ	1/8W
R203	ERD10TJ103	Carbon	10KΩ	1/8W
R204	ERD10TJ132	Carbon	1.3KΩ	1/8W
R206	ERD10TJ102	Carbon	1KΩ	1/8W
R210	ERD10TJ104	Carbon	100KΩ	1/8W
R211	ERD10TJ561	Carbon	560Ω	1/8W
R212	ERD10TJ562	Carbon	5.6KΩ	1/8W
R213	ERD10TJ472	Carbon	4.7KΩ	1/8W
R221	ERD10TJ332	Carbon	3.3KΩ	1/8W
R222	ERD10TJ102	Carbon	1KΩ	1/8W
R223	ERD10TJ222	Carbon	2.2KΩ	1/8W
R224	ERD10TJ103	Carbon	10KΩ	1/8W
R225	ERD10TJ472	Carbon	4.7KΩ	1/8W
R226	ERD10TJ101	Carbon	100Ω	1/8W
R227	ERD10TJ153	Carbon	15KΩ	1/8W
R228	ERG1ANJ470	Metal	47Ω	1/8W
R229	ERX1ANJR56	Metal	0.56Ω	1W
R230	ERD10TJ561	Carbon	560Ω	1/8W
R231	ERD10TJ682	Carbon	6.8KΩ	1/8W
R232	ERD10TJ153	Carbon	15KΩ	1/8W
R233,234	ERD10TJ104	Carbon	100KΩ	1/8W
R235	ERD10TJ103	Carbon	10KΩ	1/8W
R236	ERD10TJ911	Carbon	910Ω	1/8W
R237	ERD10TJ561	Carbon	560Ω	1/8W
R238	ERD10TJ752	Carbon	7.5KΩ	1/8W
R239	ERD10TJ332	Carbon	3.3KΩ	1/8W
R240	ERD10TJ103	Carbon	10KΩ	1/8W
R241	ERD10TJ104	Carbon	100KΩ	1/8W
R242	ERD10TJ102	Carbon	1KΩ	1/8W
R243	ERD10TJ273	Carbon	27KΩ	1/8W
VR100	YFH1021A4R7K	Variable Resistor	4.7KΩ	
VR102,103	YWSR19R1KB	Variable Resistor	1KΩ	
VR200	YWH0651A680	Variable Resistor	680Ω	
VR202	YWH0651A2R2K	Variable Resistor	2.2KΩ	
VR203	YFH1621C1MB	Variable Resistor		
VR204,205	YWH0651A10K	Variable Resistor	10KΩ	
C100	ECEA1CS220	Electrolytic	22μF	16V
C101,102	ECSF16E15	Electrolytic	15μF	16V
C103	ECQV05104JZ	Plastic	0.1μF	50V
C104	ECQV05224JZ	Plastic	0.22μF	50V
C105	ECQP1472JZ	Plastic	4700pF	100V
C106	ECEA1CS101	Electrolytic	100μF	16V
C107	ECEA1AS102	Electrolytic	1000μF	10V
C201	ECEA1HSS3R3	Electrolytic	3.3μF	50V
C202	ECEA1HNR47S	Electrolytic	0.47μF	50V
C203,206	ECEA1CSS100	Electrolytic	10μF	16V
C207	ECSF10E2R2	Electrolytic	2.2μF	10V
C208	ECQV5273JZ	Plastic	0.027μF	50V
C212	ECEA1ASS471	Electrolytic	470μF	10V
C213	ECCF1H101JC	Seramic	100pF	50V
C214,215	ECQV05153JZ	Plastic	0.015μF	50V
C216	ECQV05273JZ	Plastic	0.027μF	50V
C217	ECEA1HS010	Electrolytic	1μF	50V
C218,219	ECQP1392JZ	Plastic	3900pF	100V
C220	ECEA1HS010	Electrolytic	1μF	50V
C221	ECEA1AS101	Electrolytic	100μF	10V
C222	ECQV05153JZ	Plastic	0.015μF	50V
C223	ECEA1ASS222	Electrolytic	2200μF	10V
C224	ECEA1CS100	Electrolytic	10μF	16V
C225	ECCF1H151JC	Ceramic	150pF	50V
C226 ⚠	ECQM2223JZ	Plastic	0.022μF	200V
C227	ECEA25W10Z	Electrolytic	10μF	25V
C228,229	ECEA2CS100	Electrolytic	10μF	160V
C230	ECEA2WS010	Electrolytic	1μF	450V
C231	ECEA1HSS3R3	Electrolytic	3.3μF	50V
C232	ECEA1AS101	Electrolytic	100μF	10V
C233	ECEA1CSS100	Electrolytic	10μF	16V
C234	ECEA1ASS222	Electrolytic	2200μF	10V
C235	ECEA1AS101	Electrolytic	100μF	10V
C236	ECEA0JSS470	Electrolytic	47μF	6.3V
L3 ⚠	ELH16F718	Coil		
L4 ⚠	ELH5L1	Coil		
T200 ⚠	ETF-35L14V	Flyback Transformer		
T201	TLH3412K	Low Freq Transformer		
CN3-PF	EMCM0313D35V	3 pin Plug Female to Video Board		
CN5-JM	EMCS0352M	3 pin Jack Male		
CN6-JM	EMCS0452M	4 pin Jack Male		
CN7-JM	EMCS0352M1G	3 pin Jack Male		
CN8-JM	EMCS0252M	2 pin Jack Male		
CN9-JM	EMCS0252M1R	2 pin Jack Male		
M536	*YFV2HA0054A3	Shield Case A		

SYMBOL NO.	PART NO.	DESCRIPTION
M537	*YFV2HA0055A4	Shield Case B
M538	*YFV2PA0026A4	Insulator Paper

YFVPKC0035FA
V/F VIDEO AMPLIFIER BOARD

SYMBOL NO.	PART NO.	DESCRIPTION
PCB502	*YFVPKC0035FA	Printed Circuit Board Assembly
IC201	TC4538BP	IC
Q1, 2	2SD636-RS	Transistor
Q3	2SB641-RS	Transistor
Q4	2SD636-RS	Transistor
Q5	2SC1216-F	Transistor
Q6	2SC2258	Transistor
Q7	2SB685-RS	Transistor
Q8	2SB641-RS	Transistor
Q9	2SD636-RS	Transistor
Q10	2SD661-TU	Transistor
Q204	2SD636-RS	Transistor
Q205	2SD661-TU	Transistor
D1, 2	MA161	Diode
D3	MA162	Diode
D4	YUDERB24-04C	Diode
D5	0A91	Diode
D6, 7	MA165	Diode
R1, 2	ERD10TJ563	Carbon 56KΩ 1/8W
R3	ERD10TJ102	Carbon 1KΩ 1/8W
R4, 6	ERD10TJ222	Carbon 2.2KΩ 1/8W
R7	ERD10TJ183	Carbon 18KΩ 1/8W
R8	ERD10TJ563	Carbon 56KΩ 1/8W
R9	ERD10TJ102	Carbon 1KΩ 1/8W
R10	ERD10TJ561	Carbon 560Ω 1/8W
R11	ERD10TJ151	Carbon 150Ω 1/8W
R12	ERD10TJ152	Carbon 1.5KΩ 1/8W
R14	ERD10TJ562	Carbon 5.6KΩ 1/8W
R15	ERD10TJ103	Carbon 10KΩ 1/8W
R16	ERD10TJ331	Carbon 330Ω 1/8W
R17	ERD25FJ391	Carbon 390Ω 1/4W
R18	ERD25FJ820	Carbon 82Ω 1/4W
R19	ERD10TJ681	Carbon 680Ω 1/8W
R20	ERD10TJ472	Carbon 4.7KΩ 1/8W
R21	ERD10TJ332	Carbon 3.3KΩ 1/8W
R22	ERD10TJ822	Carbon 8.2KΩ 1/8W
R23	ERD10TJ822	Carbon 8.2KΩ 1/8W
R24	ERG2ANJ103	Metal 10KΩ 2W
R25	ERG1ANJ102	Metal 1KΩ 1W
R26	ERD10TJ394	Carbon 390KΩ 1/8W
R28	ERD10TJ273	Carbon 27KΩ 1/8W
R29	ERD25FJ473	Carbon 47KΩ 1/4W
R30	ERD25FJ333	Carbon 33KΩ 1/4W
R31	ERD10TJ391	Carbon 390Ω 1/8W
R32	ERD10TJ563	Carbon 56KΩ 1/8W
R33	ERD10TJ224	Carbon 220KΩ 1/8W
R34	ERD10TJ101	Carbon 100Ω 1/8W
R35	ERD10TJ272	Carbon 2.7KΩ 1/8W
R36	ERD10TJ332	Carbon 3.3KΩ 1/8W
R37	ERD10TJ102	Carbon 1KΩ 1/8W
R38	ERD10TJ472	Carbon 4.7KΩ 1/8W
R39	ERD10TJ272	Carbon 2.7KΩ 1/8W
R41	ERD10TJ910	Carbon 91Ω 1/8W
R42	ERD10TJ752	Carbon 7.5KΩ 1/8W
R43	ERD10TJ103	Carbon 10KΩ 1/8W
R44	ERD10TJ182	Carbon 1.8KΩ 1/8W
R45	ERD10TJ103	Carbon 10KΩ 1/8W
R46	ERD10TJ122	Carbon 1.2KΩ 1/8W
R214	ERD10TJ473	Carbon 47KΩ 1/8W
R215	ERD10TJ104	Carbon 100KΩ 1/8W
R216	ERD10TJ563	Carbon 56KΩ 1/8W
R217	ERD10TJ103	Carbon 10KΩ 1/8W
R218	ERD10TJ223	Carbon 22KΩ 1/8W
R219	ERD10TJ561	Carbon 560Ω 1/8W
R220	ERD10TJ103	Carbon 10KΩ 1/8W
VR3	YWSR19R470KB	Variable Resistor 470KΩ
C1	ECEA1CS470	Electrolytic 47μF 16V
C2, 3	ECEA1AS101	Electrolytic 100μF 10V
C4	ECEA1CS470	Electrolytic 47μF 16V
C6	ECKF1H471KB	Ceramic 470pF 50V
C8	ECEA1AS471	Electrolytic 470μF 10V
C9	ECEA1CN100S	Electrolytic 10μF 16V
C10	ECEA1AS101	Electrolytic 100μF 10V
C11	ECQP1122JZ	Plastic 1200pF 100V
C13	ECEA1CS100	Electrolytic 10μF 16V
C14	ECEA0JS101	Electrolytic 100μF 6.3V
C16	ECEA2CS010	Electrolytic 1μF 160V
C17	ECQV05333JZ	Plastic 0.033μF 50V
C18	ECEA1HS010	Electrolytic 1μF 50V
C19	ECEA1AS101	Electrolytic 100μF 10V
C20, 21	ECQV05223JZ	Plastic 0.022μF 50V
C23	ECEA1AS221	Electrolytic 220μF 10V
C24	ECEA1HS010	Electrolytic 1μF 50V
C25	ECQV05563JZ	Plastic 0.056μF 50V
C26	ECQV05104JZ	Plastic 0.1μF 50V
C27	ECQV05103JZ	Plastic 0.01μF 50V
C28	ECQV05104JZ	Plastic 0.1μF 50V
C29	ECEA2CS100	Electrolytic 10μF 160V
C30	ECEA1ASS102	Electrolytic 1000μF 10V
C31	ECCF1H680JC	Ceramic 68pF 50V
C32	ECKF1H331KB	Ceramic 330pF 50V
C33	ELEA1HSS220	Electrolytic 22μF 50V
C209	ECQV05223JZ	Plastic 0.022μF 50V
C210	ECQP1221JZ	Plastic 220pF 100V
L1	YFL5680J	Coil 68μH
L2	YFL5220J	Coil 22μH
CN1-JM	EMCS0452M	4 pin Jack Male
CN2-JM, 3-JM	EMCS0352M	3 pin Jack Male
CN4-JM	EMCS0552M	5 pin Jack Male
CN5-PF	EMCM0310D35V	3 pin Plug Female to Deflection Board
CN6-PF	EMCM0409D32Y	4 pin plug Female to Deflection Board

SYMBOL NO.	PART NO.	DESCRIPTION
M516	*YF2SA0046A4	Mounting Angle for Variable Resistor

YFVPKE0035PA
LED BOARD

SYMBOL NO.	PART NO.	DESCRIPTION
PCB503	*YFVPKE0035PA	Printed Circuit Board Assembly
D213	LN23L	Light Emiting Diode
CN9-PF	EMCM0220DR5	2 pin Plug Female to Deflection Board
M548	YWE2400FR01	LED Holder

YFVPKF0035PA
CONNECTOR BOARD

SYMBOL NO.	PART NO.	DESCRIPTION
PCB504	*YFVPKF0035PA	Printed Circuit Board Assembly
CN11-JM	EMCS0751ML	7 pin Jack Male
CN12-JM	YFDEC9PF0	9 pin Connector Socket
M518	YWSR5N4	Cord Clamp
M541	*YFV5EA0062A3	Connector Cover A
M542	*YFV5EA0061A3	Connector Cover B

ACCESSORY PARTS/PACKAGING PARTS

SYMBOL NO.	PART NO.	DESCRIPTION
PL501	YWS9G1012V12	Pilot Lamp
M550	*YFV5MA0005A4	Shoe
M551	YWV3805KM03	Hood
M552	YWV3805FM01	Mounting Screw for Hood (X2)
M553	*YFV8QA0092AN	Operating Instruction
M554	YW-B-RB01	Warranty Card
M555	YWV22XPRB99H	Service Center List
M556	YWV385PLR02U	Tally Card No. 1
M557	YWV385PLR03U	Tally Card No. 2
M558	YWT10X10C03	Polyethylene Bag for Screw
M559	YWT20X35C03	Polyethylene Bag for Hood
M560	XZB26X40C05	Polyethylene Bag for Connector Box and Printed Matter
M561	XZB35X50C05	Polyethylene Bag for WV-VF35
M562	YWT10X16C03	Polyethylene Bag for Tally Card
M565	*YFV9CA0118AN	Packaging Case

WV-RC30/ABCG REMOTE CONTROL UNIT

MISCELLANEOUS

SYMBOL NO.	PART NO.	DESCRIPTION
Q124	2SA1065	Transistor
D21	LN21RPH	LED (Red)
D22	LN31-GCP	LED (Green)
R408,409	ERD25FJ750	Carbon 75Ω 1/4W
VR44	EVHC0HK20B14	Variable Resistor for Iris 10KΩ
VR45	EVHC0AK20B13	Variable Resistor for Inter com Level 1KΩ
VR47	EVHC0AS15B53	Variable Resistor for 5KΩ H Phase
T1 ⚠	YFHPB60E008	Power Transformer
SW1 ⚠	EST-1554	Power Switch
SW2	YFM2028ES	ABC/AWC Autoset Switch
SW3	YFM2012ES	Auto/Manual Autoset Switch
SW4	YFM2012ESG	Camera/Bar Switch
SW6	YFSRN1024	Cable Comp Switch
SW7, 8	YFM023ESG	Aux/ENC and R.G.B. Change Over Switch (X2)
SW9, 10	YFM2012ESG	OFF/-G and OFF/Detail Switch
SW11,12	YSTS-J0282-4	Gen-Lock/Aux Input Change Over Switch
CN31~40	YWBNC-R	BNC Connector
CN41	YYJMBP2532F	Camera Cable Connector
CN42	YWAA-34	Tally/Intercom
CN43	YWLJ194-1-1	Intercom Jack
CN44	YWS2-104WIS0	Transistor Socket
CN45 ⚠	YWKPLTSA-8	AC Power Cord for WV-RC30/A
⚠	YWHBS-3-08	AC Power Cord for WV-RC30/B
⚠	YWCE099-08F	AC Power Cord for WV-RC30/C
⚠	YWVM0099-08	AC Power Cord for WV-RC30/G
CN1-PF	*EMCM0362B52S	3 pin Plug Female
CN2-PF	*EMCM0337BR2S	3 pin Plug Female
CN3-PF	*EMCM0347B53S	3 pin Plug Female
CN4-PF	*EMCM0320B53S	3 pin Plug Female
CN5-PF	*EMCM0337B53S	3 pin Plug Female
CN6-PF	*EMCM0343B53S	3 pin Plug Female
CN7-PF	*EMCM0316B52S	3 pin Plug Female
CN8-PF	*EMCM0419B52W	4 pin Plug Female
CN9-PF	*EMCM0308B52S	3 pin Plug Female
CN10-PF	*EMCM0316B52S	3 pin Plug Female
CN11-PF	*EMCM0314B52S	3 pin Plug Female
CN12-PF	*EMCM0351D52S	3 pin Plug Female
CN13-PF	*EMCM0353D52S	3 pin Plug Female
CN14-PF	*EMCM0373DR2S	3 pin Plug Female
CN15-PF	*EMCM0831D52W	8 pin Plug Female
CN16-PF	*EMCM0322B52S	3 pin Plug Female
CN17-PF	*EMCM0333B53S	3 pin Plug Female
CN18-PF	*EMCM0335DR2S	3 pin Plug Female
CN19-PF	*EMCM0315DR5	3 pin Plug Female
CN20-PF	*EMCM0313DG5	3 pin Plug Female
CN21-PF	*EMCM0531D52S	5 pin Plug Female
CN22-PF	*EMCM0313DG2S	3 pin Plug Female
CN23-PF	*EMCM0630D52S	6 pin Plug Female
CN24-PF	*EMCM0322D55	3 pin Plug Female
CN25-PF	*EMCM1012D52W	10 pin Plug Female
CN26-PF	*EMCM0336D52S	3 pin Plug Female

SYM-BOL NO.	PART NO.	DESCRIPTION
CN27-PF	*EMCM0413D52W	4 pin Plug Female
CN28-PF	*EMCM0432D55	4 pin Plug Female
M601	*YFV5EA0059A3	Upper Cover
M602	*YFV5EA0058A2	Side Cover (X2)
M603	*YFV5WA0058A2	Front Panel
M604	*YFV5DA0005A4	Protector Handle
M605	*YFV5RA0012A3	Knob for Intercom Level and Iris
M606	YWV8310HR11	Knob (Red x 2)
M607	YWV8310HR12	Knob (Blue x 2)
M608	*YFV5RA0013A4	Knob (Grey)
M610	*YFV2KA0033A2	Front Chassis
M611	YWJ800PWB01	LED Holder (x2)
M612	*YFV2SA0040A4	Mounting Angle A for Variable Resistor
M613	*YFV2KA0034C3	Chassis for Power Transformer
M614	YWV5350LM04	Mounting Plate for Power Transformer
M615	*YFV5WA0059A2	Rear Panel
M616	YWSR-6W-1	Cord Clamp
M617	YWJ4600AM02A	Heat Sink
M618	YWJ4600KM01A	Cover for Heat Sink
M619	*YFV2SA0042A4	Mounting Angle B for Circuit Board
M620	YFV2SA0041A4	Mounting Angle C for Circuit Board
M623	*YFV5EA0060A3	Lower Cover
M624	YWV5350WB01	Rubber Hoot (x 4)
M625 △	*YFV7QA0186A4	Main Label
M626 △	YVZC700RB50	Serial No. Label
M627 △	YWS-CULRB08	Screw Caution Label
M635	YW-BCG-UR01B	Earth Label for WV-RC 30/BCG

YFVPKP0030FA
MAIN BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION
PCB601	*YFVPKF0030PB	Printed Circuit Board Assembly
IC1	DN-850	IC
IC2	YWHD14001BP	IC
IC3, 4	YWHD14051BP	IC
IC5	YWHD14011BP	IC
IC6	YWHA17812P	IC
Q1	2SC828-RS	Transistor
Q2	2SA838-BC	Transistor
Q3~6	2SC828-RS	Transistor
Q7	2SC1216-F	Transistor
Q8~16	2SC828-RS	Transistor
Q17,18	2SC1317-RS	Transistor
Q19~33	2SC828-RS	Transistor
Q34,35	2SC1317-RS	Transistor
Q36	2SC828-RS	Transistor
Q37	2SA838-BC	Transistor
Q38~53	2SC828-RS	Transistor
Q54	2SA564-RS	Transistor
Q55~57	2SC828-RS	Transistor

SYM-BOL NO.	PART NO.	DESCRIPTION		
Q58, 59	2SC1317-RS	Transistor		
Q60~75	2SC828-RS	Transistor		
Q76	2SA564-RS	Transistor		
Q77~79	2SC828-RS	Transistor		
Q80, 81	2SC1317-RS	Transistor		
Q82~96	2SC828-RS	Transistor		
Q97, 98	2SC1317-RS	Transistor		
Q99, 100	2SC828-RS	Transistor		
Q101	2SA564-RS	Transistor		
Q102~111	2SC828-RS	Transistor		
Q112,113	2SC1317-RS	Transistor		
Q114~116	2SC828-RS	Transistor		
Q117,118	2SC1317-RS	Transistor		
Q119	2SA838-BC	Transistor		
Q120~123	2SC828-RS	Transistor		
D1	YUDXZ-080	Diode		
D2	XZ076	Diode		
D4	YUDXZ-080	Diode		
D7	MA150	Diode		
D8	YUDXZ-080	Diode		
D11	MA150	Diode		
D12, 15	YUDXZ-080	Diode		8V
D16, 17	MA165	Diode		
D18, 19	YUDXZ-080	Diode		8V
D20	YWM4C51-13	Diode		
R1	ERD10TJ223	Carbon	22KΩ	1/8W
R2	ERD10TJ473	Carbon	47KΩ	1/8W
R3	ERD10TJ331	Carbon	330Ω	1/8W
R4	ERD10TJ222	Carbon	2.2KΩ	1/8W
R5	ERD10TJ224	Carbon	220KΩ	1/8W
R6	ERD10TJ563	Carbon	56KΩ	1/8W
R7	ERD10TJ472	Carbon	4.7KΩ	1/8W
R8	ERD10TJ152	Carbon	1.5KΩ	1/8W
R9	ERD10TJ392	Carbon	3.9KΩ	1/8W
R10	ERD10TJ562	Carbon	5.6KΩ	1/8W
R11, 12	ERD10TJ563	Carbon	56KΩ	1/8W
R13	ERD10TJ183	Carbon	18KΩ	1/8W
R14	ERD10TJ101	Carbon	100Ω	1/8W
R15	ERD10TJ222	Carbon	2.2KΩ	1/8W
R16	ERD10TJ151	Carbon	150Ω	1/8W
R17	ERD10TJ331	Carbon	330Ω	1/8W
R18	ERD10TJ102	Carbon	1KΩ	1/8W
R19	ERD10TJ222	Carbon	2.2KΩ	1/8W
R20	ERD10TJ682	Carbon	6.8KΩ	1/8W
R21	ERD10TJ471	Carbon	470Ω	1/8W
R22	ERD10TJ272	Carbon	2.7KΩ	1/8W
R23	ERD10TJ122	Carbon	1.2KΩ	1/8W
R24	ERD10TJ103	Carbon	10KΩ	1/8W
R25	ERD10TJ392	Carbon	3.9KΩ	1/8W
R26	ERD10TJ822	Carbon	8.2KΩ	1/8W
R27, 28	ERD10TJ561	Carbon	560Ω	1/8W
R29	ERD10TJ101	Carbon	100Ω	1/8W
R30	ERD10TJ152	Carbon	1.5KΩ	1/8W
R31	ERD10TJ221	Carbon	220Ω	1/8W
R32	ERD10TJ151	Carbon	150Ω	1/8W
R33	ERD10TJ392	Carbon	3.9KΩ	1/8W
R34	ERD10TJ822	Carbon	8.2KΩ	1/8W
R35, 36	ERD10TJ561	Carbon	560Ω	1/8W
R37	ERD10TJ271	Carbon	270Ω	1/8W
R38	ERD10TJ152	Carbon	1.5KΩ	1/8W

SYMBOL NO.	PART NO.	DESCRIPTION		
R39	ERD10TJ392	Carbon	3.9KΩ	1/8W
R40	ERD10TJ822	Carbon	8.2KΩ	1/8W
R41, 42	ERD10TJ561	Carbon	560Ω	1/8W
R43	ERD10TJ181	Carbon	180Ω	1/8W
R44	ERD10TJ152	Carbon	1.5KΩ	1/8W
R45	ERD10TJ471	Carbon	470Ω	1/8W
R46	ERD25FJ103	Carbon	10KΩ	1/4W
R47	ERD10TJ103	Carbon	10KΩ	1/8W
R48	ERD10TJ273	Carbon	27KΩ	1/8W
R49	ERD10TJ152	Carbon	1.5KΩ	1/8W
R51	ERD10TJ152	Carbon	1.5KΩ	1/8W
R52	ERD10TJ272	Carbon	2.7KΩ	1/8W
R53	ERD10TJ821	Carbon	820Ω	1/8W
R54	ERD10TJ562	Carbon	5.6KΩ	1/8W
R55	ERD10TJ100	Carbon	10Ω	1/8W
R56	ERD10TJ182	Carbon	1.8KΩ	1/8W
R57	ERD10TJ222	Carbon	2.2KΩ	1/8W
R58, 59	ERD10TJ330	Carbon	33Ω	1/8W
R60	ERD10TJ181	Carbon	180Ω	1/8W
R61	ERD10TJ223	Carbon	22KΩ	1/8W
R62, 63	ERD10TJ750	Carbon	75Ω	1/8W
R64	ERD10TJ103	Carbon	10KΩ	1/8W
R65	ERD10TJ273	Carbon	27KΩ	1/8W
R66	ERD10TJ101	Carbon	100Ω	1/8W
R67	ERD10TJ821	Carbon	820Ω	1/8W
R68	ERD10TJ223	Carbon	22KΩ	1/8W
R69	ERD10TJ221	Carbon	220Ω	1/8W
R70	ERD10TJ122	Carbon	1.2KΩ	1/8W
R71	ERD10TJ472	Carbon	4.7KΩ	1/8W
R72	ERD10TJ821	Carbon	820Ω	1/8W
R73	ERD10TJ103	Carbon	10KΩ	1/8W
R74	ERD10TJ223	Carbon	22KΩ	1/8W
R75	ERD10TJ182	Carbon	1.8KΩ	1/8W
R76	ERD10TJ223	Carbon	22KΩ	1/8W
R77	ERD10TJ182	Carbon	1.8KΩ	1/8W
R78	ERD10TJ101	Carbon	100Ω	1/8W
R79	ERD10TJ223	Carbon	22KΩ	1/8W
R80	ERD10TJ152	Carbon	1.5KΩ	1/8W
R81	ERD10TJ223	Carbon	22KΩ	1/8W
R82	ERD10TJ562	Carbon	5.6KΩ	1/8W
R83	ERD25FJ223	Carbon	22KΩ	1/4W
R84	ERD10TJ621	Carbon	620Ω	1/8W
R85	ERD10TJ751	Carbon	750Ω	1/8W
R86	ERD10TJ102	Carbon	1KΩ	1/8W
R87	ERD10TJ122	Carbon	1.2KΩ	1/8W
R88~91	ERD10TJ223	Carbon	22KΩ	1/8W
R92	ERD10TJ471	Carbon	470Ω	1/8W
R93	ERD10TJ121	Carbon	120Ω	1/8W
R94	ERD10TJ122	Carbon	1.2KΩ	1/8W
R95	ERD10TJ103	Carbon	10KΩ	1/8W
R96	ERD10TJ273	Carbon	27KΩ	1/8W
R97	ERD10TJ101	Carbon	100Ω	1/8W
R98	ERD10TJ821	Carbon	820Ω	1/8W
R99	ERD10TJ101	Carbon	100Ω	1/8W
R100	ERD10TJ152	Carbon	1.5KΩ	1/8W
R101	ERD10TJ272	Carbon	2.7KΩ	1/8W
R102	ERD10TJ821	Carbon	820Ω	1/8W
R103	ERD10TJ562	Carbon	5.6KΩ	1/8W
R104	ERD10TJ100	Carbon	10Ω	1/8W
R105	ERD10TJ182	Carbon	1.8KΩ	1/8W
R106	ERD10TJ222	Carbon	2.2KΩ	1/8W
R107, 108	ERD10TJ330	Carbon	33Ω	1/8W
R109	ERD10TJ181	Carbon	180Ω	1/8W
R110	ERD10TJ223	Carbon	22KΩ	1/8W
R111, 112	ERD10TJ750	Carbon	75Ω	1/8W
R113	ERD10TJ103	Carbon	10KΩ	1/8W
R114	ERD10TJ273	Carbon	27KΩ	1/8W
R115	ERD10TJ101	Carbon	100Ω	1/8W
R116	ERD10TJ222	Carbon	2.2KΩ	1/8W
R117	ERD10TJ224	Carbon	220KΩ	1/8W
R118	ERD10TJ563	Carbon	56KΩ	1/8W
R119	ERD10TJ472	Carbon	4.7KΩ	1/8W
R120	ERD25FJ152	Carbon	1.5KΩ	1/4W
R121	ERD10TJ682	Carbon	6.8KΩ	1/8W
R122	ERD10TJ750	Carbon	75Ω	1/8W
R123	ERD10TJ103	Carbon	10KΩ	1/8W
R124	ERD10TJ273	Carbon	27KΩ	1/8W
R125	ERD10TJ101	Carbon	100Ω	1/8W
R126	ERD10TJ821	Carbon	820Ω	1/8W
R127	ERD10TJ223	Carbon	22KΩ	1/8W
R128	ERD10TJ221	Carbon	220Ω	1/8W
R129	ERD10TJ122	Carbon	1.2KΩ	1/8W
R130	ERD10TJ472	Carbon	4.7KΩ	1/8W
R131	ERD10TJ821	Carbon	820Ω	1/8W
R132	ERD10TJ103	Carbon	10KΩ	1/8W
R133	ERD10TJ223	Carbon	22KΩ	1/8W
R134	ERD10TJ182	Carbon	1.8KΩ	1/8W
R135	ERD10TJ223	Carbon	22KΩ	1/8W
R136	ERD10TJ182	Carbon	1.8KΩ	1/8W
R137	ERD10TJ101	Carbon	100Ω	1/8W
R138	ERD10TJ223	Carbon	22KΩ	1/8W
R139	ERD10TJ152	Carbon	1.5KΩ	1/8W
R140	ERD10TJ223	Carbon	22KΩ	1/8W
R141	ERD10TJ562	Carbon	5.6KΩ	1/8W
R142	ERD25FJ223	Carbon	22KΩ	1/4W
R143	ERD10TJ621	Carbon	620Ω	1/8W
R144	ERD10TJ751	Carbon	750Ω	1/8W
R145	ERD10TJ102	Carbon	1KΩ	1/8W
R146	ERD10TJ122	Carbon	1.2KΩ	1/8W
R147	ERD25FJ223	Carbon	22KΩ	1/4W
R148, R149	ERD10TJ223	Carbon	22KΩ	1/8W
R150	ERD25FJ223	Carbon	22KΩ	1/4W
R151	ERD10TJ471	Carbon	470Ω	1/8W
R152	ERD10TJ121	Carbon	120Ω	1/8W
R153	ERD10TJ122	Carbon	1.2KΩ	1/8W
R154	ERD10TJ153	Carbon	15KΩ	1/8W
R155	ERD10TJ101	Carbon	100Ω	1/8W
R156	ERD10TJ561	Carbon	560Ω	1/8W
R157	ERD10TJ101	Carbon	100Ω	1/8W
R158, 159	ERD10TJ561	Carbon	560Ω	1/8W
R160	ERD10TJ101	Carbon	100Ω	1/8W
R161	ERD10TJ153	Carbon	15KΩ	1/8W
R162	ERD10TJ561	Carbon	560Ω	1/8W
R163	ERD10TJ122	Carbon	1.2KΩ	1/8W

SYM-BOL NO.	PART NO.	DESCRIPTION		
R164, 165	ERD10TJ471	Carbon	470Ω	1/8W
R166	ERD25FJ101	Carbon	100Ω	1/4W
R167	ERD10TJ153	Carbon	15KΩ	1/8W
R168	ERD10TJ473	Carbon	47KΩ	1/8W
R169	ERD10TJ471	Carbon	470Ω	1/8W
R170	ERD10TJ222	Carbon	2.2KΩ	1/8W
R171	ERD10TJ331	Carbon	330Ω	1/8W
R172	ERD10TJ103	Carbon	10KΩ	1/8W
R173	ERD10TJ273	Carbon	27KΩ	1/8W
R174	ERD10TJ101	Carbon	100Ω	1/8W
R175	ERD10TJ821	Carbon	820Ω	1/8W
R176	ERD10TJ101	Carbon	100Ω	1/8W
R177	ERD10TJ152	Carbon	1.5KΩ	1/8W
R178	ERD10TJ272	Carbon	2.7KΩ	1/8W
R179	ERD10TJ821	Carbon	820Ω	1/8W
R180	ERD10TJ562	Carbon	5.6KΩ	1/8W
R181	ERD10TJ100	Carbon	10Ω	1/8W
R182	ERD10TJ182	Carbon	1.8KΩ	1/8W
R183	ERD10TJ222	Carbon	2.2KΩ	1/8W
R184, 185	ERD10TJ330	Carbon	33Ω	1/8W
R186	ERD10TJ181	Carbon	180Ω	1/8W
R187	ERD10TJ223	Carbon	22KΩ	1/8W
R188, 189	ERD10TJ750	Carbon	75Ω	1/8W
R190	ERD10TJ103	Carbon	10KΩ	1/8W
R191	ERD10TJ273	Carbon	27KΩ	1/8W
R192	ERD10TJ101	Carbon	100Ω	1/8W
R193	ERD10TJ821	Carbon	820Ω	1/8W
R194	ERD10TJ223	Carbon	22KΩ	1/8W
R195	ERD10TJ221	Carbon	220Ω	1/8W
R196	ERD10TJ122	Carbon	1.2KΩ	1/8W
R197	ERD10TJ472	Carbon	4.7KΩ	1/8W
R198	ERD10TJ821	Carbon	820Ω	1/8W
R199	ERD10TJ103	Carbon	10KΩ	1/8W
R200	ERD10TJ223	Carbon	22KΩ	1/8W
R201	ERD10TJ182	Carbon	1.8KΩ	1/8W
R202	ERD10TJ223	Cargon	22KΩ	1/8W
R203	ERD10TJ182	Carbon	1.8KΩ	1/8W
R204	ERD25FJ101	Carbon	100Ω	1/4W
R205	ERD10TJ223	Carbon	22KΩ	1/8W
R206	ERD10TJ152	Carbon	1.5KΩ	1/8W
R207	ERD10TJ223	Carbon	22KΩ	1/8W
R208	ERD10TJ562	Carbon	5.6KΩ	1/8W
R209	ERD10TJ223	Carbon	22KΩ	1/8W
R210	ERD10TJ621	Carbon	620Ω	1/8W
R211	ERD10TJ751	Carbon	750Ω	1/8W
R212	ERD10TJ102	Carbon	1KΩ	1/8W
R213	ERD10TJ122	Carbon	1.2KΩ	1/8W
R214~217	ERD10TJ223	Carbon	22KΩ	1/8W
R218	ERD10TJ471	Carbon	470Ω	1/8W
R219	ERD10TJ121	Carbon	120Ω	1/8W
R220	ERD10TJ122	Carbon	1.2KΩ	1/8W
R221	ERD10TJ153	Carbon	15KΩ	1/8W
R222	ERD10TJ101	Carbon	100Ω	1/8W
R223	ERD10TJ561	Carbon	560Ω	1/8W
R224	ERD10TJ101	Carbon	100Ω	1/8W
R225, 226	ERD10TJ561	Carbon	560Ω	1/8W
R227	ERD10TJ101	Carbon	100Ω	1/8W

SYM-BOL NO.	PART NO.	DESCRIPTION		
R228	ERD10TJ153	Carbon	15KΩ	1/8W
R229	ERD10TJ561	Carbon	560Ω	1/8W
R230	ERD10TJ122	Carbon	1.2KΩ	1/8W
R231, 232	ERD10TJ471	Carbon	470Ω	1/8W
R233	ERD10TJ101	Carbon	100Ω	1/8W
R234	ERD10TJ153	Carbon	15KΩ	1/8W
R235	ERD10TJ473	Carbon	47KΩ	1/8W
R236	ERD10TJ471	Carbon	470Ω	1/8W
R237	ERD10TJ222	Carbon	2.2KΩ	1/8W
R238	ERD10TJ331	Carbon	330Ω	1/8W
R239	ERD10TJ103	Carbon	10KΩ	1/8W
R240	ERD10TJ273	Carbon	27KΩ	1/8W
R241	ERD10TJ101	Carbon	100Ω	1/8W
R242	ERD10TJ821	Carbon	820Ω	1/8W
R243	ERD10TJ101	Carbon	100Ω	1/8W
R244	ERD10TJ152	Carbon	1.5KΩ	1/8W
R245	ERD10TJ272	Carbon	2.7KΩ	1/8W
R246	ERD10TJ821	Carbon	820Ω	1/8W
R247	ERD10TJ562	Carbon	5.6KΩ	1/8W
R248	ERD10TJ100	Carbon	10Ω	1/8W
R249	ERD10TJ182	Carbon	1.8KΩ	1/8W
R250	ERD10TJ222	Carbon	2.2KΩ	1/8W
R251, 252	ERD10TJ330	Carbon	33Ω	1/8W
R253	ERD10TJ181	Carbon	180Ω	1/8W
R254	ERD10TJ223	Carbon	22KΩ	1/8W
R255, 256	ERD10TJ750	Carbon	75Ω	1/8W
R257	ERD10TJ103	Carbon	10KΩ	1/8W
R258	ERD10TJ273	Carbon	27KΩ	1/8W
R259	ERD10TJ101	Carbon	100Ω	1/8W
R260	ERD10TJ821	Carbon	820Ω	1/8W
R261	ERD10TJ223	Carbon	22KΩ	1/8W
R262	ERD10TJ221	Carbon	220Ω	1/8W
R263	ERD10TJ122	Carbon	1.2KΩ	1/8W
R264	ERD10TJ472	Carbon	4.7KΩ	1/8W
R265	ERD10TJ821	Carbon	820Ω	1/8W
R266	ERD10TJ103	Carbon	10KΩ	1/8W
R267	ERD10TJ223	Carbon	22KΩ	1/8W
R268	ERD10TJ182	Carbon	1.8KΩ	1/8W
R269	ERD10TJ223	Carbon	22KΩ	1/8W
R270	ERD10TJ182	Carbon	1.8KΩ	1/8W
R271	ERD10TJ101	Carbon	100Ω	1/8W
R272	ERD10TJ223	Carbon	22KΩ	1/8W
R273	ERD10TJ152	Carbon	1.5KΩ	1/8W
R274	ERD10TJ223	Carbon	22KΩ	1/8W
R275	ERD10TJ562	Carbon	5.6KΩ	1/8W
R276	ERD25FJ223	Carbon	22KΩ	1/4W
R277	ERD10TJ621	Carbon	620Ω	1/8W
R278	ERD10TJ751	Carbon	750Ω	1/8W
R279	ERD10TJ102	Carbon	1KΩ	1/8W
R280	ERD10TJ122	Carbon	1.2KΩ	1/8W
R281~284	ERD10TJ223	Carbon	22KΩ	1/8W
R285	ERD10TJ471	Carbon	470Ω	1/8W
R286	ERD10TJ121	Carbon	120Ω	1/8W
R287	ERD10TJ122	Carbon	1.2KΩ	1/8W
R288	ERD10TJ103	Carbon	10KΩ	1/8W
R289	ERD10TJ273	Carbon	27KΩ	1/8W
R290	ERD10TJ101	Carbon	100Ω	1/8W
R291	ERD10TJ821	Carbon	820Ω	1/8W

SYMBOL NO.	PART NO.	DESCRIPTION
R292	ERD10TJ101	Carbon 100Ω 1/8W
R293	ERD10TJ152	Carbon 1.5KΩ 1/8W
R294	ERD10TJ272	Carbon 2.7KΩ 1/8W
R295	ERD10TJ821	Carbon 820Ω 1/8W
R296	ERD10TJ562	Carbon 5.6KΩ 1/8W
R297	ERD10TJ100	Carbon 10Ω 1/8W
R298	ERD10TJ182	Carbon 1.8KΩ 1/8W
R299	ERD10TJ222	Carbon 2.2KΩ 1/8W
R300, 301	ERD10TJ330	Carbon 33Ω 1/8W
R302	ERD10TJ181	Carbon 180Ω 1/8W
R303	ERD10TJ223	Carbon 22KΩ 1/8W
R304	ERD10TJ750	Carbon 75Ω 1/8W
R305	ERD10TJ124	Carbon 120KΩ 1/8W
R306	ERD10TJ103	Carbon 10KΩ 1/8W
R307	ERD10TJ562	Carbon 5.6KΩ 1/8W
R308	ERD10TJ822	Carbon 8.2KΩ 1/8W
R309	ERD10TJ332	Carbon 3.3KΩ 1/8W
R310	ERD10TJ103	Carbon 10KΩ 1/8W
R311	ERD10TJ222	Carbon 2.2KΩ 1/8W
R312	ERG1ANJ470	Metal 47Ω 1W
R313	ERD10TJ681	Carbon 680Ω 1/8W
R314	ERD10TJ562	Carbon 5.6KΩ 1/8W
R315	ERD10TJ223	Carbon 22KΩ 1/8W
R316	ERD10TJ562	Carbon 5.6KΩ 1/8W
R317, 318	ERD10TJ103	Carbon 10KΩ 1/8W
R319	ERD10TJ561	Carbon 560Ω 1/8W
R320	ERD10TJ472	Carbon 4.7KΩ 1/8W
R321	ERD10TJ333	Carbon 33KΩ 1/8W
R322	ERD10TJ472	Carbon 4.7KΩ 1/8W
R323	ERD10TJ391	Carbon 390Ω 1/8W
R324	ERD10TJ103	Carbon 10KΩ 1/8W
R325,326	ERD10TJ331	Carbon 330Ω 1/8W
R327	ERD10TJ104	Carbon 100KΩ 1/8W
R328	ERD10TJ103	Carbon 10KΩ 1/8W
R329	ERG1ANJ271	Metal 270Ω 1W
R330	ERD10TJ393	Carbon 39KΩ 1/8W
R331	ERD10TJ333	Carbon 33KΩ 1/8W
R332	ERD10TJ332	Carbon 3.3KΩ 1/8W
R333	ERD10TJ104	Carbon 100KΩ 1/8W
R334	ERD10TJ103	Carbon 10KΩ 1/8W
R335	ERD10TJ102	Carbon 1KΩ 1/8W
R336	ERD10TJ470	Carbon 47Ω 1/8W
R337	ERD10TJ564	Carbon 560KΩ 1/8W
R338	ERD10TJ473	Carbon 47KΩ 1/8W
R339~341	ERD10TJ564	Carbon 560KΩ 1/8W
R342	ERD10TJ103	Carbon 10KΩ 1/8W
R343	ERD10TJ273	Carbon 27KΩ 1/8W
R344	ERD10TJ101	Carbon 100Ω 1/8W
R345	ERD10TJ821	Carbon 820Ω 1/8W
R346	ERD10TJ101	Carbon 100Ω 1/8W
R347	ERD10TJ223	Carbon 22KΩ 1/8W
R348	ERD10TJ152	Carbon 1.5KΩ 1/8W
R349	ERD10TJ272	Carbon 2.7KΩ 1/8W
R350	ERD10TJ821	Carbon 820Ω 1/8W
R351	ERD10TJ562	Carbon 5.6KΩ 1/8W
R352	ERD10TJ100	Carbon 10Ω 1/8W
R353	ERD10TJ182	Carbon 1.8KΩ 1/8W
R354	ERD10TJ222	Carbon 2.2KΩ 1/8W
R355, 356	ERD10TJ330	Carbon 33Ω 1/8W
R357	ERD10TJ181	Carbon 180Ω 1/8W
R358	ERD10TJ223	Carbon 22KΩ 1/8W
R359	ERD10TJ750	Carbon 75Ω 1/8W
R360	ERD10TJ103	Carbon 10KΩ 1/8W
R361	ERD10TJ273	Carbon 27KΩ 1/8W
R362	ERD10TJ101	Carbon 100Ω 1/8W
R363	ERD10TJ821	Carbon 820Ω 1/8W
R364	ERD10TJ101	Carbon 100Ω 1/8W
R365	ERD10TJ152	Carbon 1.5KΩ 1/8W
R366	ERD10TJ272	Carbon 2.7KΩ 1/8W
R367	ERD10TJ821	Carbon 820Ω 1/8W
R368	ERD10TJ562	Carbon 5.6KΩ 1/8W
R369	ERD10TJ100	Carbon 10Ω 1/8W
R370	ERD10TJ182	Carbon 1.8KΩ 1/8W
R371	ERD10TJ222	Carbon 2.2KΩ 1/8W
R372, 373	ERD10TJ330	Carbon 33Ω 1/8W
R374	ERD10TJ181	Carbon 180Ω 1/8W
R375	ERD10TJ223	Carbon 22KΩ 1/8W
R376	ERD10TJ750	Carbon 75Ω 1/8W
R377~380	ERD10TJ473	Carbon 47KΩ 1/8W
R381	ERD10TJ103	Carbon 10KΩ 1/8W
R382~385	ERD10TJ104	Carbon 100KΩ 1/8W
R386	ERD10TJ394	Carbon 390KΩ 1/8W
R387	ERD10TJ302	Carbon 3KΩ 1/8W
R410	ERD10TJ101	Carbon 100Ω 1/8W
R411	ERD10TJ562	Carbon 5.6KΩ 1/8W
R412	ERD10TJ122	Carbon 1.2KΩ 1/8W
R413	ERD10TJ391	Carbon 390Ω 1/8W
R414	ERD10TJ104	Carbon 100KΩ 1/8W
R415	ERD10TJ101	Carbon 100Ω 1/8W
R416	ERD25FJ222	Carbon 2.2KΩ 1/4W
R417, 418	ERD10TJ102	Carbon 1KΩ 1/8W
VR1	YWH0651A4R7K	Variable Resistor 4.7KΩ
VR2	YWH0651A10K	Variable Resistor 10KΩ
VR3	YWH0651A1K	Variable Resistor 1KΩ
VR4	YWH0651A4R7K	Variable Resistor 4.7KΩ
VR5	YWH0651A470	Variable Resistor 470Ω
VR6	YWH0651A1K	Variable Resistor 1KΩ
VR7	YWH0651A470	Variable Resistor 470Ω
VR8	YWH0651A1K	Variable Resistor 1KΩ
VR9	YWH0651A680	Variable Resistor 680Ω
VR10	YWH0651A220	Variable Resistor 220Ω
VR11	YWH0651A470	Variable Resistor 470Ω
VR12	YWH0651A1K	Variable Resistor 1KΩ
VR13	YWH0651A680	Variable Resistor 680Ω
VR14	YWH0651A220	Variable Resistor 220Ω
VR15	YWH0651A470	Variable Resistor 470Ω
VR16	YWH0651A1K	Variable Resistor 1KΩ
VR17	YWH0651A470	Variable Resistor 470Ω
VR18	YWH0651A10K	Variable Resistor 10KΩ
VR19	YWH0651A4R7K	Variable Resistor 4.7KΩ
VR20, 21	YWH0651A470	Variable Resistor 470Ω
VR22	YWH0651A10K	Variable Resistor 10KΩ
VR43	YWH0651A4R7K	Variable Resistor 4.7KΩ
VR46	EWKENAS20B13	Variable Resistor 1KΩ
C1	ECEA1CS470	Electrolytic 47μF 16V

SYMBOL NO.	PART NO.	DESCRIPTION		
C2	ECEA1CS100	Electrolytic	10µF	16V
C3, 4	ECEA1CS470	Electrolytic	47µF	16V
C5	ECQP1122JZ	Plastic	1200pF	100V
C6	ECQP1561JZ	Plastic	560pF	100V
C7	ECQP1221JZ	Plastic	220pF	100V
C8	ECCW1H181JC	Ceramic	180pF	50V
C9	ECQV05223JZ	Plastic	0.022µF	50V
C10	ECEA1CS470	Electrolytic	47µF	16V
C11	ECQV05103JZ	Plastic	0.01µF	50V
C12	ECQP1271JZ	Plastic	270pF	100V
C13, 14	ECQV05103JZ	Plastic	0.01µF	50V
C15	ECQP1101JZ	Plastic	100pF	100V
C16	ECQV05103JZ	Plastic	0.01µF	50V
C17	ECQP1101JZ	Plastic	100pF	100V
C18	ECEA1CSS221	Electrolytic	220µF	16V
C19	ECEA1ASS101	Electrolytic	100µF	10V
C20	ECEA1CS222	Electrolytic	2200µF	16V
C21	ECEA1CS101	Electrolytic	100µF	16V
C22	ECEA1CS470	Electrolytic	47µF	16V
C23	ECCW1H101JC	Ceramic	100pF	50V
C24	ECCW1H470JC	Ceramic	47pF	50V
C25	ECCW1H680JC	Ceramic	68pF	50V
C26	ECCW1H820JC	Ceramic	82pF	50V
C27	ECCW1H560JC	Ceramic	56pF	50V
C28	ECCW1H470JC	Ceramic	47pF	50V
C29	ECCW1H330JC	Ceramic	33pF	50V
C30	ECCW1H100JC	Ceramic	10pF	50V
C31	ECCW1H080DC	Ceramic	8pF	50V
C32	ECEA1CSS101	Electrolytic	100µF	16V
C33~36	ECQP1102JZ	Plastic	1000pF	100V
C37	ECEA1CS470	Electrolytic	47µF	16V
C38	ECEA1CSS221	Electrolytic	220µF	16V
C39	ECEA1CS470	Electrolytic	47µF	16V
C40	ECET25R472SW	Electrolytic	4700µF	25V
C41	ECEA1CS470	Electrolytic	47µF	16V
C42	ECEA1CS100	Electrolytic	10µF	16V
C43	ECCW1H330JC	Ceramic	33pF	50V
C44	ECEA1CS470	Electrolytic	47µF	16V
C45	ECCW1H101JC	Ceramic	100pF	50V
C46	ECCW1H470JC	Ceramic	47pF	50V
C47	ECCW1H680JC	Ceramic	68pF	50V
C48	ECCW1H820JC	Ceramic	82pF	50V
C49	ECCW1H560JC	Ceramic	56pF	50V
C50	ECCW1H470JC	Ceramic	47pF	50V
C51	ECCW1H330JC	Ceramic	33pF	50V
C52	ECCW1H100JC	Ceramic	10pF	50V
C53	ECCW1H080DC	Ceramic	8pF	50V
C54	ECEA1CS471	Electrolytic	470µF	16V
C55~58	ECQP1102JZ	Plastic	1000pF	100V
C59	ECEA1CS470	Electrolytic	47µF	16V
C60	ECEA1CSS101	Electrolytic	100µF	16V
C61, 62	ECEA1CS470	Electrolytic	47µF	16V
C63	ECCW1H060DC	Ceramic	6pF	50V
C64, 65	ECEA1CS470	Electrolytic	47µF	16V
C66	ECEA1CSS222	Electrolytic	2200µF	16V
C67	ECEA1CS470	Electrolytic	47µF	16V
C68	ECCW1H101JC	Ceramic	100pF	50V
C69	ECCW1H470JC	Ceramic	47pF	50V
C70	ECCW1H680JC	Ceramic	68pF	50V
C71	ECCW1H820JC	Ceramic	82pF	50V
C72	ECCW1H560JC	Ceramic	56pF	50V
C73	ECCW1H470JC	Ceramic	47pF	50V
C74	ECCW1H330JC	Ceramic	33pF	50V
C75	ECCW1H100JC	Ceramic	10pF	50V
C76	ECCW1H080DC	Ceramic	8pF	50V
C77	ECEA1CS471	Electrolytic	470µF	16V
C78~81	ECQP1102JZ	Plastic	1000pF	100V
C82~84	ECEA1CS470	Electrolytic	47µF	16V
C85	ECCW1H060DC	Ceramic	6pF	50V
C86, 87	ECEA1CS470	Electrolytic	47µF	16V
C88	ECEA1CSS222	Electrolytic	2200µF	16V
C89	ECEA1CS470	Electrolytic	47µF	16V
C90	ECCW1H101JC	Ceramic	100pF	50V
C91	ECCW1H470JC	Ceramic	47pF	50V
C92	ECCW1H680JC	Ceramic	68pF	50V
C93	ECCW1H820JC	Ceramic	82pF	50V
C94	ECCW1H560JC	Ceramic	56pF	50V
C95	ECCW1H470JC	Ceramic	47pF	50V
C96	ECCW1H330JC	Ceramic	33pF	50V
C97	ECCW1H100JC	Ceramic	10pF	50V
C98	ECCW1H080DC	Ceramic	8pF	50V
C99	ECEA1CS471	Electrolytic	470µF	16V
C100~103	ECQP1102JZ	Plastic	1000pF	100V
C104	ECEA1CS470	Electrolytic	47µF	16V
C105	ECEA1AN470E	Electrolytic	47µF	10V
C106	ECEA1CSS222	Electrolytic	2200µF	16V
C107	ECQV05103JZ	Plastic	0.01µF	50V
C108	ECEA1CN221S	Electrolytic	220µF	16V
C109	ECQP1102JZ	Plastic	1000pF	100V
C110	ECEA1CN100	Electrolytic	10µF	16V
C111	ECKW1H472KB	Ceramic	4700pF	50V
C112	ECEA1HNR47E	Electrolytic	0.47µF	50V
C113	ECEA1CS100	Electrolytic	10µF	16V
C114,115	ECEA1CN100	Electrolytic	10µF	16V
C116	ECEA1HNR47	Electrolytic	0.47µF	50V
C117	ECQM1H473JZ	Plastic	0.047µF	50V
C118	ECQM1H683JZ	Plastic	0.068µF	50V
C119	ECQM1H563JZ	Plastic	0.056µF	50V
C120	ECQM1H683JZ	Plastic	0.068µF	50V
C121	ECQM1H473JZ	Plastic	0.047µF	50V
C122	ECEA1CS470	Electrolytic	0.047µF	16V
C123	ECQP1122JZ	Plastic	1200pF	100V
C124	ECEA1CSS222	Electrolytic	2200µF	16V
C125	ECEA1CSS101	Electrolytic	100µF	16V
C126	ECEA1CS470	Electrolytic	47µF	16V
C127	ECEA1CSS222	Electrolytic	2200µF	16V
C128	ECEA1CSS101	Electrolytic	100µF	16V
C129	ECQP1102JZ	Plastic	1000pF	100V
C130	ECET25R472SW	Electrolytic	4700µF	25V
C131	ECQV05334JZ	Plastic	0.33µF	50V
C132	ECQV05104JZ	Plastic	0.1µF	50V
C133	ECEA1HNR47	Electrolytic	0.47µF	50V
C134	ECEA1CSS101	Electrolytic	100µF	16V
C135	ECQP1102JZ	Plastic	1000pF	100V
C153	ECCW1H390JC	Ceramic	39pF	50V

SYM-BOL NO.	PART NO.	DESCRIPTION		
L1	YWL5100J	Coil	10μH	
L2	YFL5470J	Coil	47μH	
SW5	YFSBU1024	Rotary Switch		
CN1-JM	EMCS0352M	Connector 3 pin Jack Male		
CN2-JM	EMCS0352MIR	Connector 3 pin Jack Male		
CN3-JM~ 7-JM	EMCS0352M	3 pin Jack Male		
CN8-JM	EMCS0452M	4 pin Jack Male		
CN9-JM~ 13-JM	EMCS0352M	3 pin Jack Male		
CN14-JM	EMCS0352M1R	3 pin Jack Male		
CN15-JM	EMCS0852M	8 pin Jack Male		
CN16-JM, 17-JM	EMCS0352M	3 pin Jack Male		
CN18-JM, 19-JM	EMCS0352M1R	3 pin Jack Male		
CN20-JM	EMCS0352M1G	3 pin Jack Male		
CN21-JM	EMCS0552M	5 pin Jack Male		
CN22-JM	EMCS0352MIG	3 pin Jack Male		
CN23-JM	EMCS0652M	6 pin Jack Male		
CN24-JM	EMCS0352M	3 pin Jack Male		
CN25-JM	EMCS1052M	10 pin Jack Male		
CN26-JM	EMCS0352M	3 pin Jack Male		
CN27-JM	EMCS0452M	4 pin Jack Male		
M621	*YFV2SA0039B4	Mounting Angle		

YFSSY12050M
SWITCHING REGULATOR BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION		
PCB602	*YFSSY12050M	Printed Circuit Board Assembly		
IC1	STK-711P	Integrated Circuit		
IC2	STK-752	Integrated Circuit		
IC3	STK-761	Integrated Circuit		
T1	TA10E-R	Transistor		
PC1,2	PC714U	Photo-Coupler		
D1	DBA20G	Diode		
D2	ERC25-08	Diode		
D3	S5KC20	Diode		
ZD1	GZA6.8Y	Diode		
R1	YFMPS03N100K	Cement	10Ω	3W
R2	ERD25FJ201	Carbon	200Ω	1/4W
R3	YFMPR05N332K	Cement	3.3KΩ	5W
R4	ERG2ANJ104	Metal	100KΩ	2W
R5	ERG1ANJ470	Metal	47Ω	1W
R6	ERD25FJ155	Carbon	1.5MΩ	1/4W
R7	ERD25FJ224	Carbon	220KΩ	1/4W
R8	ERF3AK1R0	Cement	1Ω	3W
R10	ERD25FJ681	Carbon	680Ω	1/4W
R11	ERG1ANJ101	Metal	100Ω	1W
R13	ERD25FJ392	Carbon	3.9KΩ	1/4W
VR1	YFV8117102M	Variable Resistor	1KΩ	
C1, 2	ECKDHS222MD	Ceramic	2200pF	400V
C3	YF400MW224K	Plastic	0.22μF	400V
C4	LHS2G101MHSA	Electrolytic	100μF	400V
C5, 6	YFCEUSM1C221	Electrolytic	200μF	16V
C7	DE1207SL151J	Ceramic	150pF	3KV
C9, 10	YFCEUSM1E222	Electrolytic	2200μF	25V
C11	YFCEUSM1E102	Electrolytic	1000μF	25V
C12	YFMDD22J103M	Plastic	0.01μF	
C13	YFCEUSM1H2R2	Electrolytic	2.2μF	50V
C14	ECKDHS102MD	Ceramic	1000pF	400V
C15	DD115FZ104Z	Ceramic	0.1μF	50V
C16	YF50F2S333K	Plastic	0.033μF	50V
L1	YFLF-14	Line Filter		
L2, 3	LAL04KB4R7K	Micro Inductor		
L4	YFPT-4 or YFPT3A	Power Transformer		
L5	YFPI-6	Power Inductor	4μH	
F1	YWTS3R15A	Fuse	3.15A	250V
F2	YWTS250MA	Fuse	0.25A	250V
E1	YF85PN0819	Fuse Holder (X4)		
E2	YF59TN4772	Earth Terminal		
M630	*YFTC-45A	Heat Sink Sheet A for Diode		
M631	*YFTC-30A	Heat Sink Sheet B for Diode		
M632	*YFSSY12050MA	Heat Sink		
M633	*YFSTK011	Mounting Plate for IC		
M634	*YFSPACER5M3M	Spacer (X4)		
M635	*YFSANY0BUSHM	Insulator Tube		

YFVPKB0030PA
CENTERING CONTROL BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION		
PCB603	*YFVPKB0030PA	Printed Circuit Board Assembly		
R404~407	ERD10TJ182	Carbon	1.8KΩ	1/8W
VR35	YWH0651A4R7K	Variable Resistor	4.7KΩ	
VR36, 37	EVS70AS15B14	Variable Resistor	10KΩ	
VR38, 39	YWH0651A4R7K	Variable Resistor	4.7KΩ	
VR40, 41	EVS70AS15B14	Variable Resistor	10KΩ	
VR42	YWH0651A4R7K	Variable Resistor	4.7KΩ	
C141~144	ECQP1102JM	Plastic	1000pF	100V
CN28-JM	EMCS0452M	4 pin Jack Male		
M622	*YFV2SA0038A4	Mounting Angled for Centering Control Board		

YFVPKC0030PA
GAIN/PEDESTAL CONTROL BOARD

SYM-BOL NO.	PART NO.	DESCRIPTION		
PCB604	*YFVPKC0030PA	Printed Circuit Board Assembly		
R391	ERD10TJ682	Carbon	6.8KΩ	1/8W
R392	ERD10TJ123	Carbon	12KΩ	1/8W
R393, 394	ERD10TJ682	Carbon	6.8KΩ	1/8W
R395	ERD10TJ123	Carbon	12KΩ	1/8W
R396	ERD10TJ682	Carbon	6.8KΩ	1/8W
R397	ERD10TJ332	Carbon	3.3KΩ	1/8W
R398	ERD10TJ103	Carbon	10KΩ	1/8W
R399	ERDS2TJ272	Carbon	2.7KΩ	2W
R400	ERD10TJ562	Carbon	5.6KΩ	1/8W
R401	ERD10TJ103	Carbon	10KΩ	1/8W
R402	ERD10TJ562	Carbon	5.6KΩ	1/8W
R403	ERD10TJ103	Carbon	10KΩ	1/8W
VR25	YWH0651A10K	Variable Resistor	10KΩ	

SYM-BOL NO.	PART NO.	DESCRIPTION
VR26 27	EVHWHAK15B15	Variable Resistor 100KΩ
VR28	YWH0651A10K	Variable Resistor 10KΩ
VR29	YWH0651A6R8K	Variable Resistor 6.8KΩ
VR30, 31	EVHWHAK15B15	Variable Resistor 100KΩ
VR32, 33	YWH0651A10K	Variable Resistor 10KΩ
VR34	EVHWHAK15B15	Variable Resistor 100KΩ
C136~140	ECQP1102JZ	Plastic 1000pF 100V

ACCESSORY PARTS/PACKAGING PARTS

SYM-BOL NO.	PART NO.	DESCRIPTION
CN50	YQAAA-33	4 pin Connector
M640	YWB350-HM01	Rack Mounting Handle
M641	YWU-L88HA	Rack Mounting Angle
M642	YFV8QA0162AN	Operating Instruction
M644	YW-B-RB01	Warranty Card for WV-RC30/B
M646	XZB26X40C05	Polyethylene Bag for Operating Instruction
M647	XZB45X63C05	Polyethylene Bag for RCU
M648	YWT050803	Polyethylene Bag for Screws
M649	YWT10X10C03	Polyethylene Bag for Connector
M650	YWT20X25C03	Polyethylene Bag for Power Cord
M651	YWT15X20C03	Polyethylene Bag for Rack Mount
M655	YFV9CA0115AN	Packaging Case

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PCB001	YFVPKP77701A
PCB002	YFVPKP777F1A
PCB003	YFVPKP777F2A
PCB004	YFVPKP77704A
PCB005	YFVPKP777F3A
PCB006	YFVPKP777F4A
PCB007	YFVPKB0777FA
PCB008	YFVPKP77708A
PCB010	YFVPKP777F6A
PCB011	YFVPKP77711A
PCB012	YFVPKP77712A
PCB013	YFVPKP77713A
PCB014	YFVPKC0777PA
PCB015	YFVPKD0777PA
PCB016	YFVPKP77716A
PCB017	YFVPKP77717B
PCB018	YFVPKP77718B
PCB019	YFVPKP77719A
PCB021	YFVPKP77721A
PCB022	YFVPKP77722A
PCB023	YFVPKP77723A
V001~003	H4101
Q001	2SA1061−P
D001	BD607RG
D002	ESAB82−004
L001	YFVAKA0053AN
VR001	EVJKYAS10B23
SW001	YFM2012ES
SW002	YFM2028ES
SW003	YFM2023ESG
SW004	YFM2012ESG
SW005	YFM2022ESG3
SW006	YFM2013ES
SW007	YFM2032ESG3
CN001	YFJMR2532M
CN002	YFCB02A1614P
CN003~005	YWBNC−R
CN006	YFDEC9PF0
CN007	YWLJ145−1A
CN008	YW−SJ296
CN009,011	YFFM16R03H
CN010	YFXLR4−32
CN013	YFR0102R98F
PCB001~006	
CN1	YFPCN65PADS
CN2	YFPCN622PADS
PCB007	
CN1	YFPCN65SDS
CN2,3	YFPCN622SDS
CN5~8	YFPCN622SDS
CN9	YF1CS6412603
CN11−JM~13−JM	EMCS0652M
CN14−JM	EMCS0452M
CN15−JM	EMCS1052M
CN16−JM	EMCS1252M
CN17−JM	EMCS0352M
CN18−JM	EMCS0252M
CN19−JM	EMCS0452M
CN20−JM	EMCS0352M
CN21−JM	EMCS1052M
CN22−JM	EMCS0252M
CN23−JM	EMCS1352M
CN24−JM	EMCS0952M
CN1−PF	EMCM0936D45
CN25~30	YFICS6412623
CN31	YFICS6412613
CN32,33	YFICS6412603
B11	EMCB0717B62V
B12	EMCC0717D42V
B13	EMCM0936D45V
B14	EMCM1025D42V
B15	EMCM0622D45V
B16	EMCM1016D45V
PCB010	
CN1~3−JM	EMCS0952M
CN4−JM	EMCS1052M
CN5−JM	EMCS0452M
CN2−PF	EMCM0210D65
PCB011	
CN1−JM	EMCS0651ML
CN2−JM	EMCS0251ML
PCB014	
CN1−JM	EMCS1052M
CN2−JM	EMCS0752
PCB015	
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CN2−JM	EMCS0352M
CN3−JM	EMCS0552M
CN4−JM	EMCS0252M
M001	YFV2KA0032BS
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M003	YFV2SA0029A4
M004	YFV5EA0043A3
M005	YFV5KA0014A3
M006	YFV4JA0021C4
M007	YFV4JA0022C4
M008	YFV5EA0041A3
M009	YFV5EA0040A3
M010	YFV2CA0015C4
M011	YFV6FA0007A3
M012	YFV7SA0038A4
M013	YFV2EA0008A4
M014	YFV4JA0023B4
M015	YFV2RA0001A3
M016	YFV2TA0008A3
M017	YFV5EA0044A4
M018	YFV2KA0030A4
M019	YFV7SA0039A4
M020	YFV2SA0030A4
M021	YFV2SA0032A4
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M026	YFV2SA0034A4
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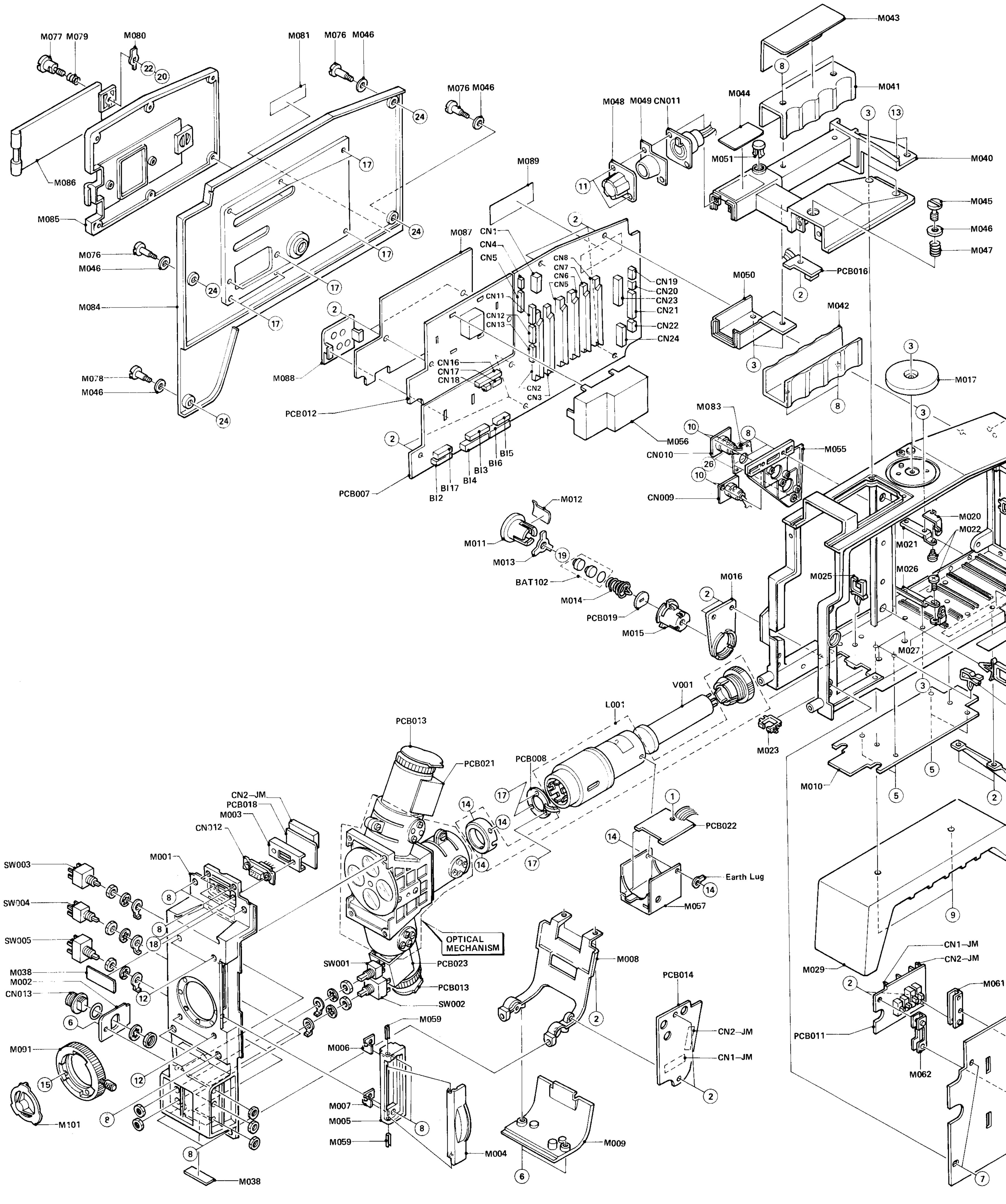
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M030	YFV7QA0182B4	M042	YFV6AA0004A3	M054	YFV1KA0004A4	M071	YFV6GA0001B2	M083	YFV6GA0008A4
M031	YFV2SA0033A4	M043	YFV5DA0003A4	M055	YFV5EB0037A3	M072	YFV2VA0008A4	M084	YFV5EA0039A4
M032	YFV2PA0016A4	M044	YFV7SA0042A4	M056	YFV2HA0034A4	M073	YFV6EA0002BS	M085	YFV6GA0002B2
M033	YFV2KA0031B2	M045	YFV1EA0007A4	M057	YFV2HA0039A4	M074	YFV2FA0023A4	M086	YFV6EA0003B3
M034	YFV2VA0006A4	M046	YFV1KA0005A4	M059	YFXPL16A8WV	M075	YFV2FB00023A4	M087	YFV2PA0015A4
M035	YFV2VA0007A4	M047	YFV4JA0020A4	M060	YFV6GA0003C3	M076	YFV1EA0005A4	M088	YFV6GA0004A4
M036	YFV5DA0006A3	M048	YFV6FA0006A3	M061	YFV2SA0027A4	M077	YFV1EA0004C4	M089	YFV2PA0016A4
M037	YFV1EA0018A4	M049	YFV2EA0003A4	M062	YFV2SA0028A4	M078	YFV1EB0005A4	M101	WN0003
M038	YFV7SA0023A4	M050	YFV5DA0002A3	M064	YFV2HA0072A4	M079	YFV4JA0017A4		
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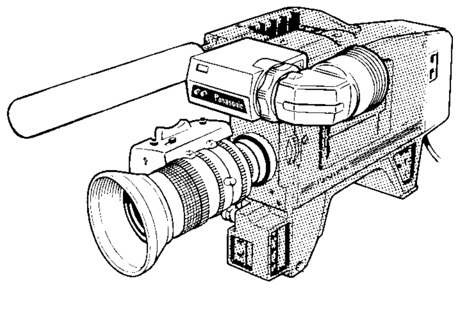

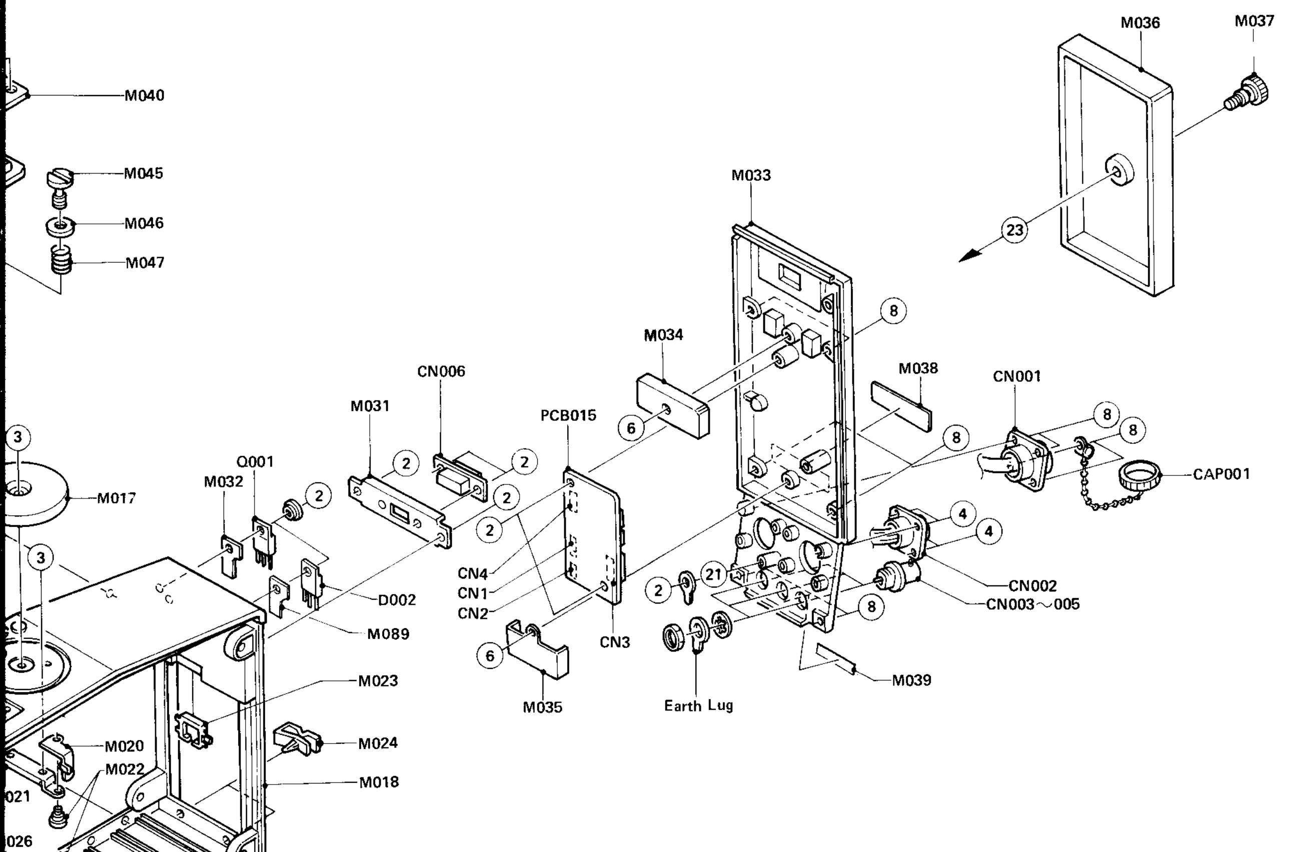
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CN2
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Earth Lug
CN002
CN003～005
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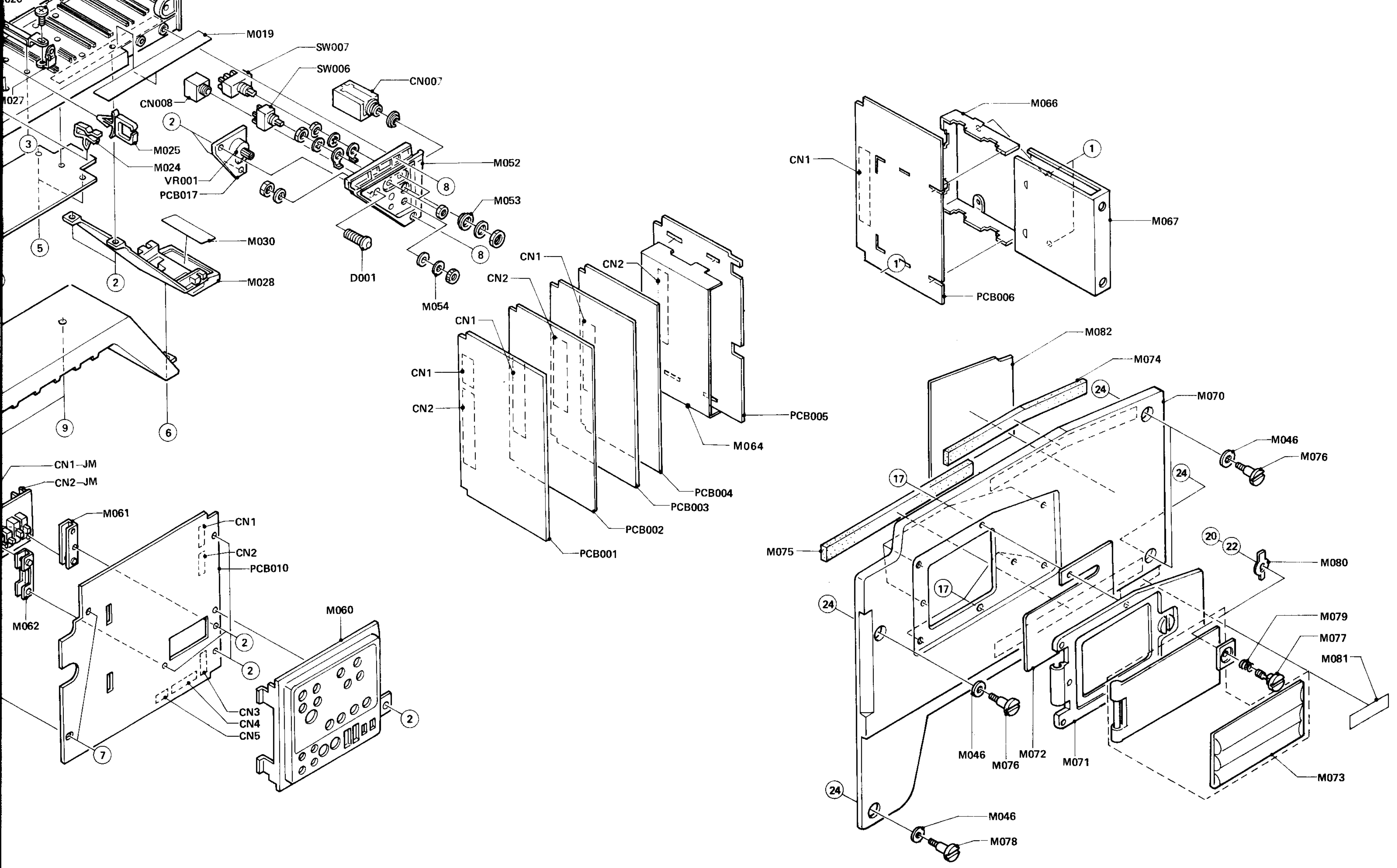
○ Numbers show screws

No.	Screws	Description
①	XSB26+4FX	Binding Head Screw
②	XSB3+6FX	Binding Head Screw
③	XSB3+6FN	Binding Head Screw
④	XSB3+8FN	Binding Head Screw
⑤	XSB3+4FXK	Binding Head Black Screws
⑥	XSB3+6FXK	Binding Head Black Screws
⑦	XSB3+6FXV	Binding Head Violet Screws
⑧	XSB3+8FXK	Binding Head Black Screws
⑨	XSB4+8FXK	Binding Head Black Screws
⑩	XSC26+8FN	Oval Countersunk Head Machine Screws
⑪	XSC26+12FN	Oval Countersunk Head Machine Screws
⑫	XSC3+10BNK	Oval Countersunk Head Machine Black Screws
⑬	XSC4+8FN	Oval Countersunk Head Machine Screws
⑭	XSN2+3BN	Pan Head Machine Screws
⑮	XSN3+8BN	Pan Head Machine Screws
⑯	XSN17+4BN	Pan Head Machine Screws
⑰	XSS2+5FXK	Flush Head Machine Black Screws
⑱	XSS2+8FXK	Flush Head Machine Black Screws
⑲	XYN3+6FN	Machine Screw and Washer
⑳	XNF3AN	Hexagon Head Nut
㉑	XWC3BFX	External Toothed Lock Washer
㉒	XWG3FN	Polished Round Plain Washer
㉓	XUC3FXK	Retaining Ring Type E
㉔	XUC4FXK	Retaining Ring Type E
㉕	XSN3+4BN	Pan Head Machine Screws
㉖	XSS26+6FXK	Flush Head Machine Black Screws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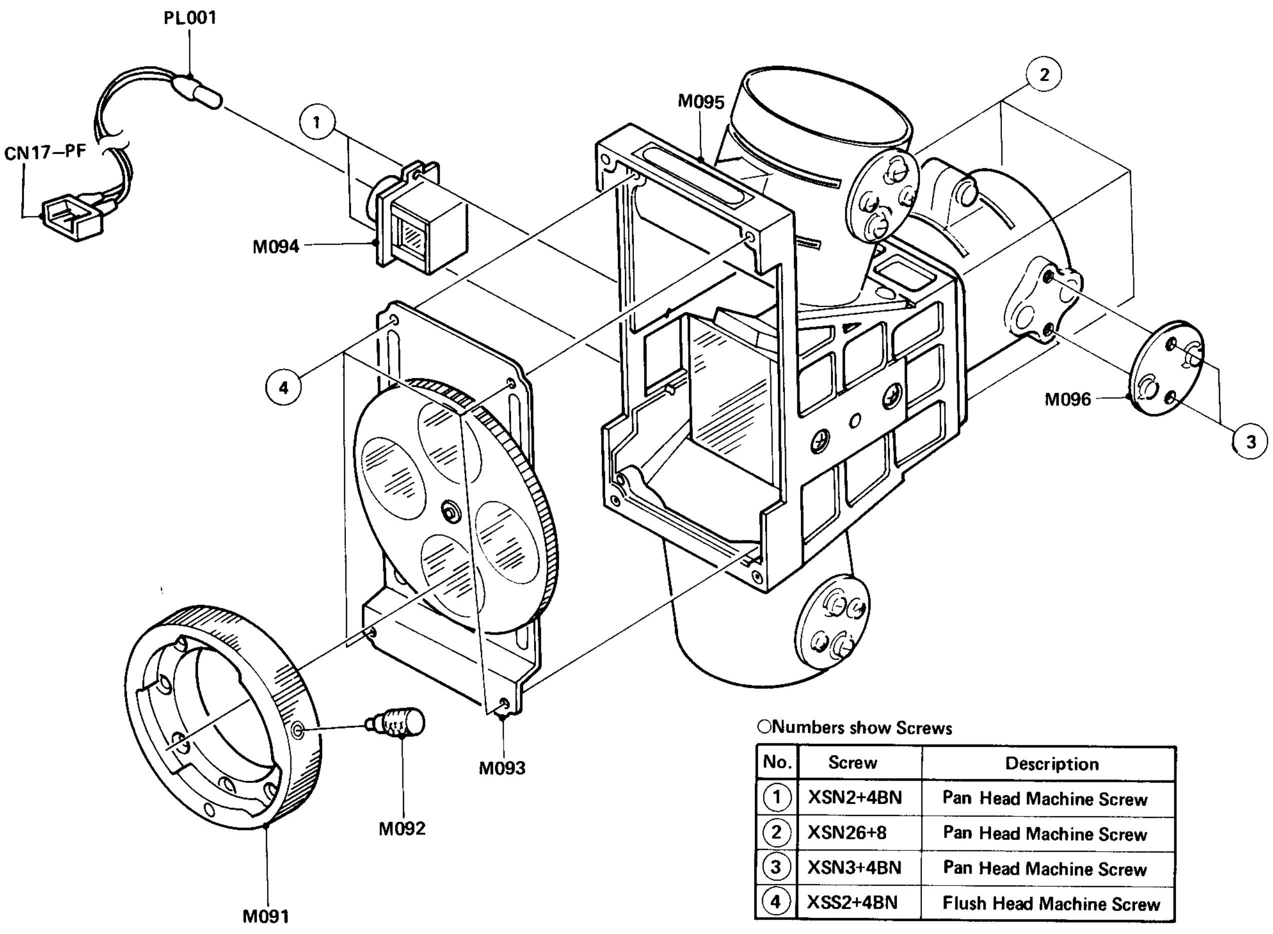
OPTICAL MECHANISM

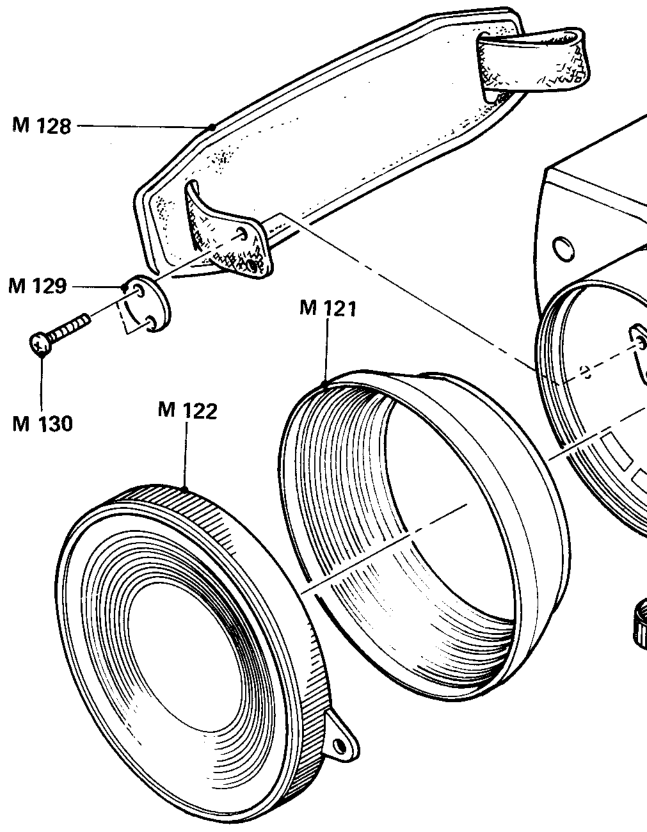


○Numbers show Screws

No.	Screw	Description
①	XSN2+4BN	Pan Head Machine Screw
②	XSN26+8	Pan Head Machine Screw
③	XSN3+4BN	Pan Head Machine Screw
④	XSS2+4BN	Flush Head Machine Screw

PL001	YF102K163432
CN17–PF	YF102K163432
M001	YFV2KA0032BS
M091	YF96A22348A0
M092	YF47B1770970
M093	YF11A3242830
M094	YF12A1780850
M095	YF10A3256440
M096	YF88A1780870

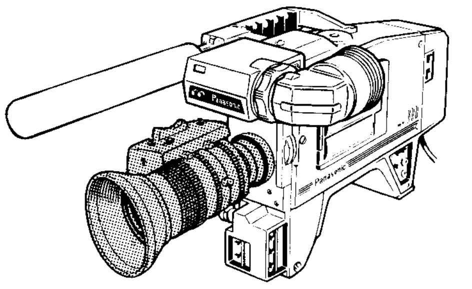
E120	YF106306	M129	YF108021
M121	YF121654	M130	YFN209030
M122	YF121658	M131	YF102251
M123	YF121657	M132	YF102252
M124	YF616129	M133	YFN202530
M125	YF121688	M134	YF102253
M126	YF616139	M135	YF113023
M127	YFN173025	M136	YFV7QA0117A4
M128	YF108022		

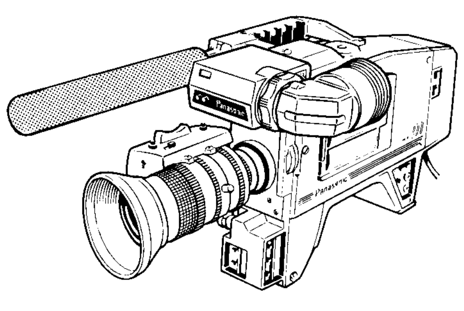


M140

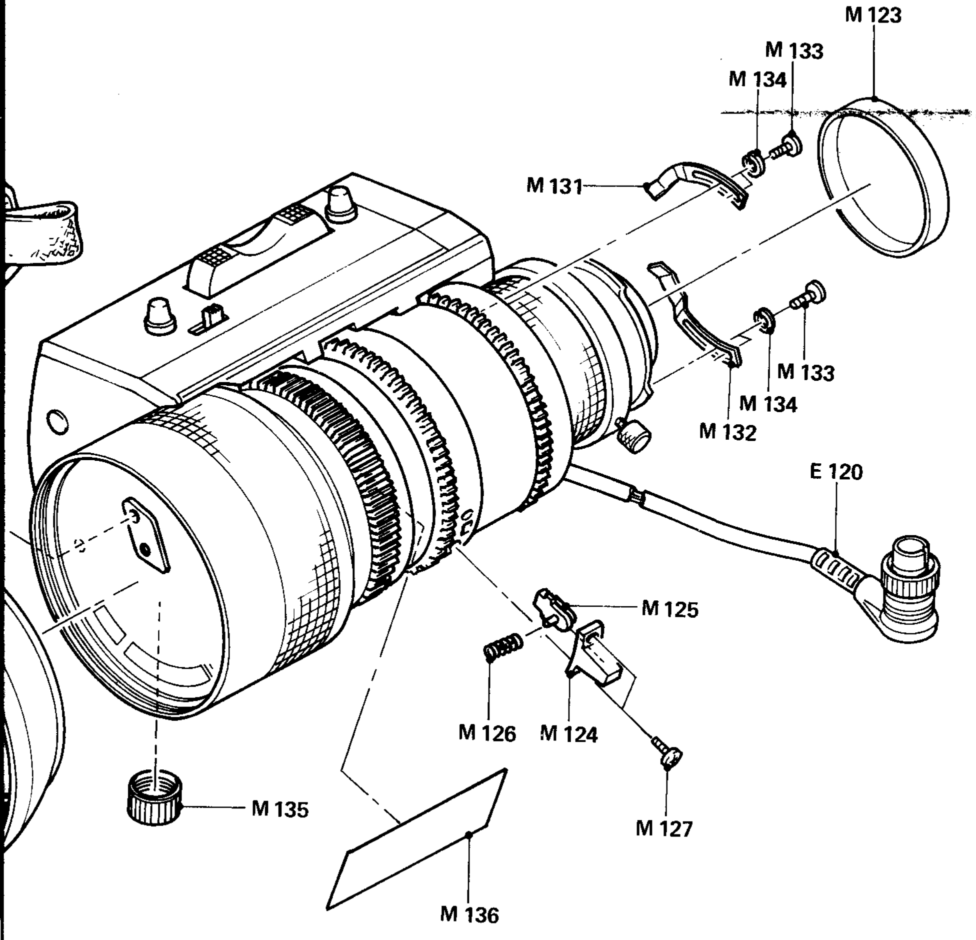
M141
M142
M145

LODED VIEWS

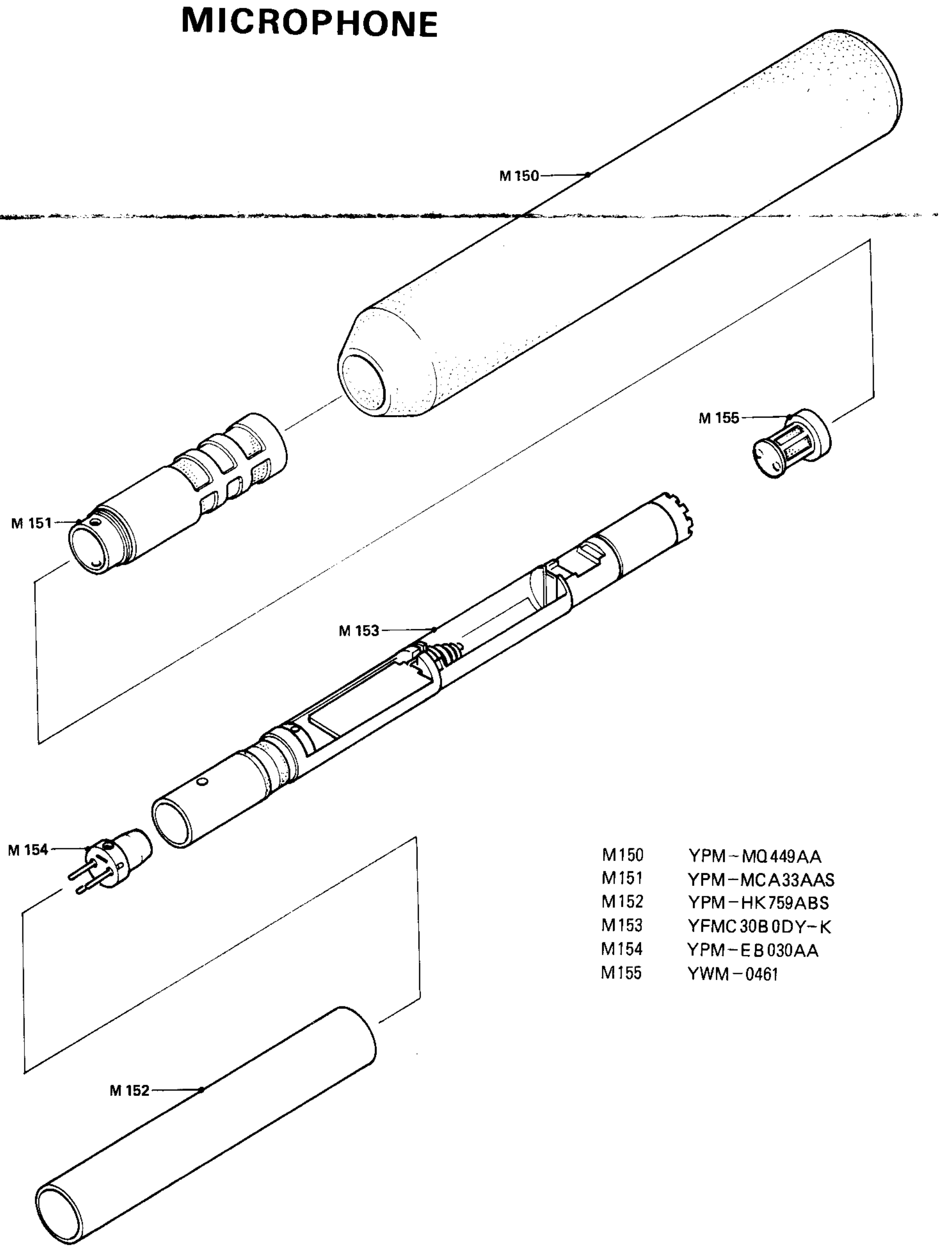




ZOOM LENS


M 123
M 133
M 134
M 131
M 133
M 134
M 132
E 120
M 125
M 126
M 124
M 127
M 135
M 136

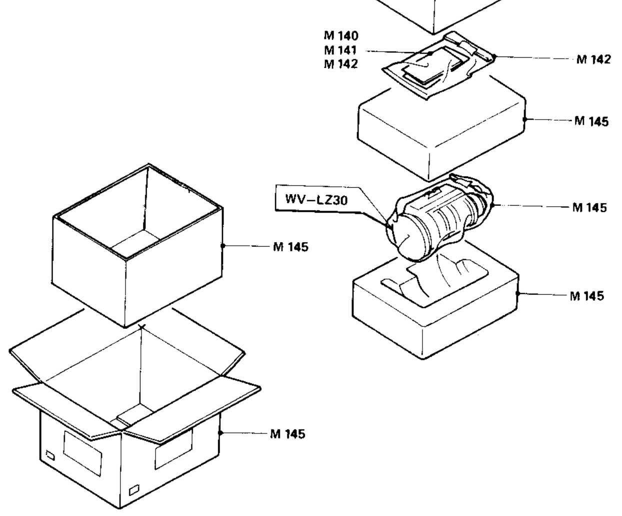
MICROPHONE


M 150
M 155
M 151
M 153
M 154
M 152

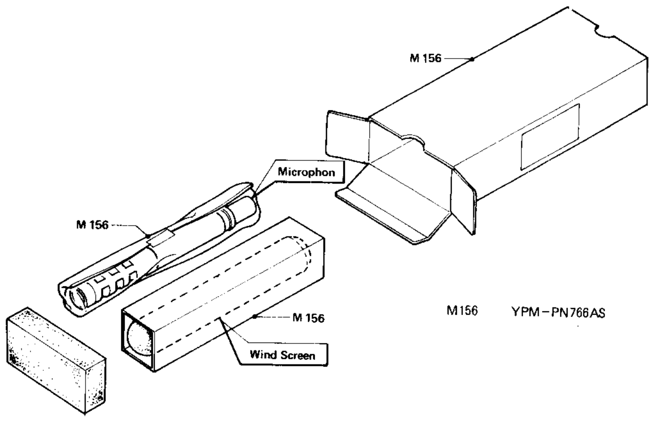
M150	YPM-MQ449AA
M151	YPM-MCA33AAS
M152	YPM-HK759ABS
M153	YFMC30B0DY-K
M154	YPM-EB030AA
M155	YWM-0461

PACKAGING

M140	YFVQA0120-2
	YFVQA0054-4
M141	YWS-EULRB01C
M142	YWT20X35C03
M145	YFV9CA0124AN

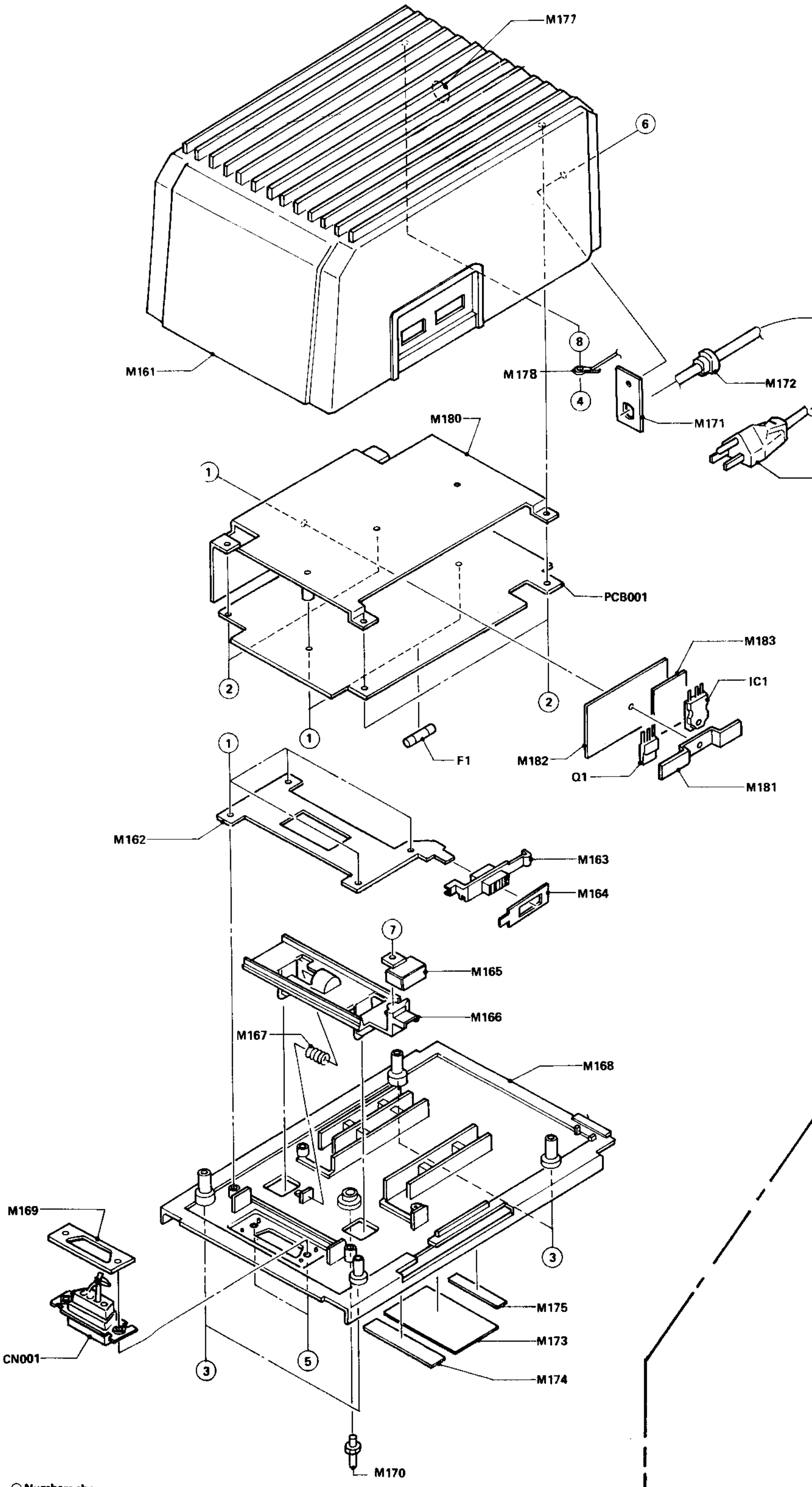

M 145
M 140
M 141
M 142
M 142
M 145
WV-LZ30
M 145
M 145
M 145
M 145

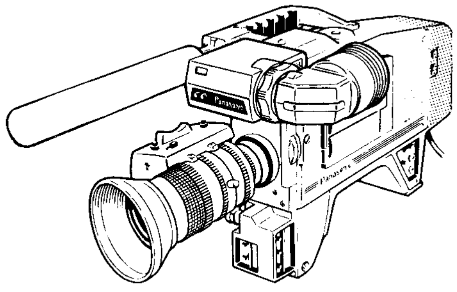
PACKAGING


M 156
Microphon
M 156
M 156
Wind Screen

M156	YPM-PN766AS

EXPLODED VIEW OF AC ADAPTOR


M177
⑥
M161
⑧
M178
④
M172
M171
E001
M180
①
PCB001
M183
IC1
②
②
①
F1
M182
Q1
M181
①
M162
M163
M164
⑦
M165
M166
M167
M168
M169
③
M175
M173
CN001
⑤
③
M174
M170

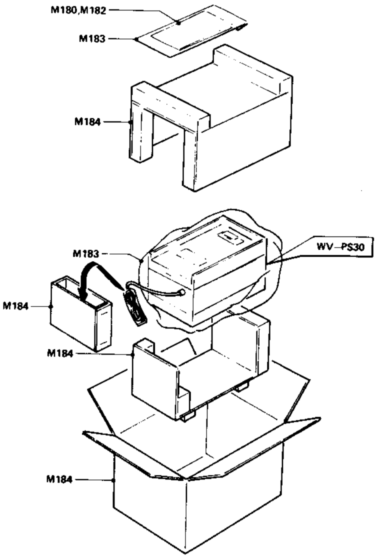


PCB001	YF3EF9720
IC1	TLP531GR
Q1	2SC2655-Y
E001	YWKPLTSA-8 YWHBS-3-08 YWCE099-08F YWVM0099-08
CN001	YFDECF9SF0
M161	YFV5KA0013B2
M162	YFV2CA0016A4
M163	YFV6JA0009A4
M164	YFV7SA0061A4
M165	YFV6JA0010A4
M166	YFV1BA0002A4
M167	YFV4JA0024C4
M168	YFV5EA0045C2
M169	YFV2SA0036A4
M170	YFV1HA0008A4
M171	YFV2SA0035B4
M172	YWSR6W-1
M173	YFV7QA0184A4
M174	YFV7SA0023A4
M175	YVZC700RB50
M177	YW-BCG-UR01B
M178	YW-BCG-EM01

○ Numbers show screws

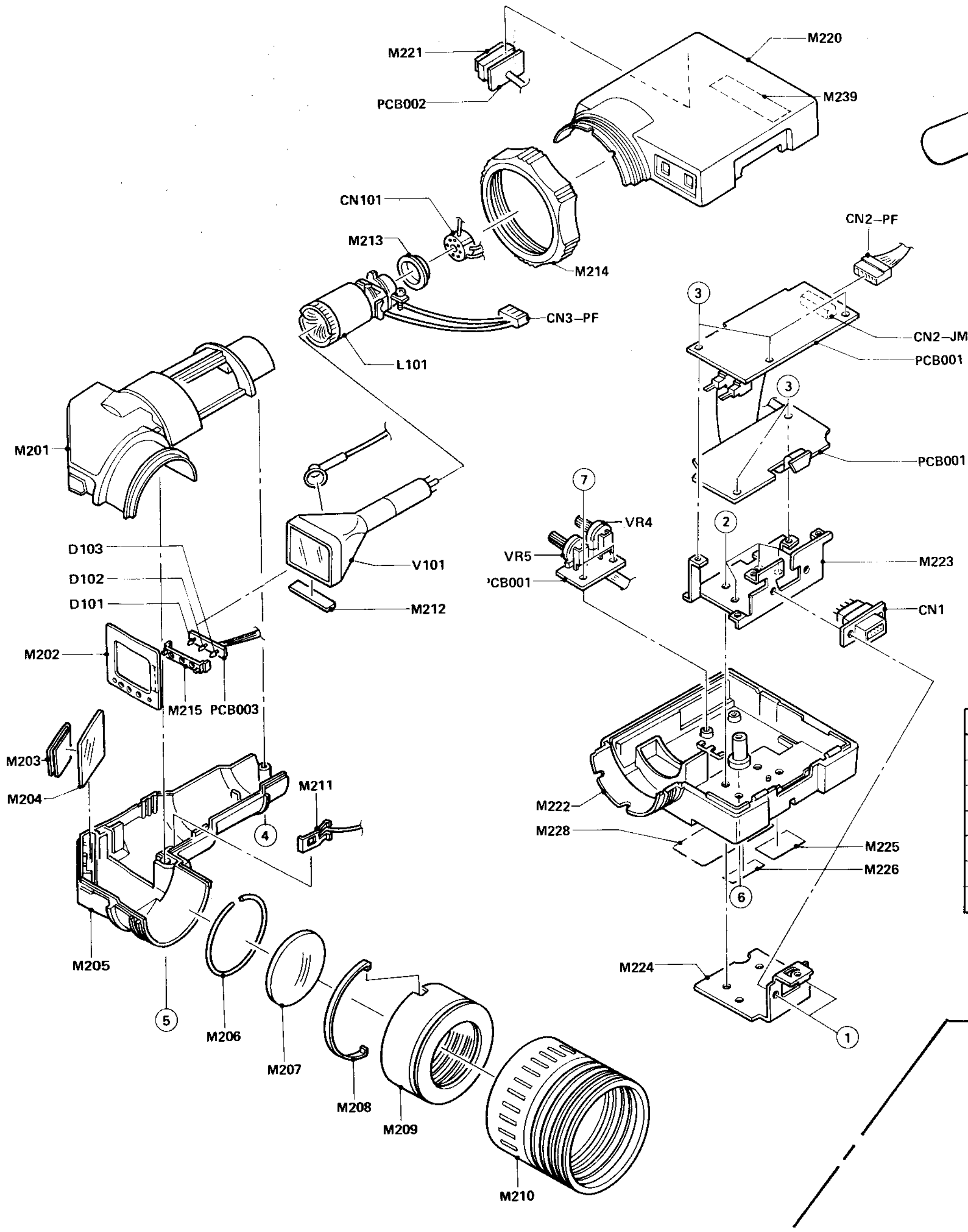
No.	Screws	Description
①	XSB3+6FX	Binding Head Screws
②	XSB3+8FXV	Binding Head Violet Screws
③	XSB3+20FXK	Binding Head Black Screws
④	XSB4+6FX	Binding Head Screws
⑤	XSS2+8FXK	Flush Head Machine Black Screws
⑥	XSS26+6FXK	Flush Head Machine Black Screws
⑦	XYN26+C6FX	Machine Screw and Washer
⑧	XWC4AFN	Internal Toothed Lock Washer

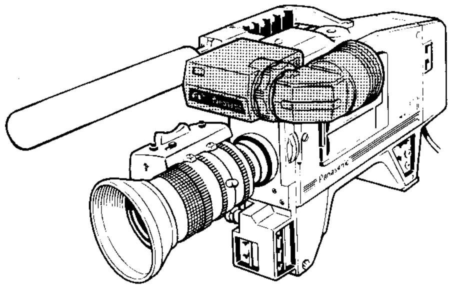
PACKAGING


M180,M182
M183
M184
M183
WV-PS30
M184
M184
M184

M180	YFV8QA0100AN
M182	YW-B-RB01
M183	YWT20X35C03
M184	YFV9CA0139AN

EXPLODED VIEW OF 1.5″ VIEW FINDER

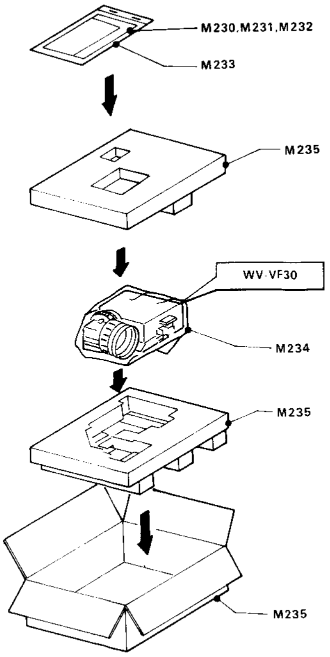

M221
PCB002
M220
M239
CN101
M213
M214
CN3–PF
L101
CN2–PF
3
CN2–JM
PCB001
3
PCB001
M201
7
VR4
VR5
PCB001
V101
M212
2
M223
CN1
D103
D102
D101
M202
M215
PCB003
M203
M204
M211
4
M222
M228
M225
M226
6
M205
M224
1
5
M206
M207
M208
M209
M210



○Numbers show screws

No.	Screws	Description
①	XSB3+6FN	Binding Head Screw
②	XSB3+8FN	Binding Head Screw
③	XSB3+6FXV	Binding Head Violet Screw
④	XTN3+25CFXK	Pan Head Tapping Blaks Screw
⑤	XTN3+35CFXK	Pan Head Tapping Black Screw
⑥	XTN4+35CFXK	Pan Head Tappind Black Screw
⑦	XTB3+5CFXK	Binding Head Tapping Black Screw

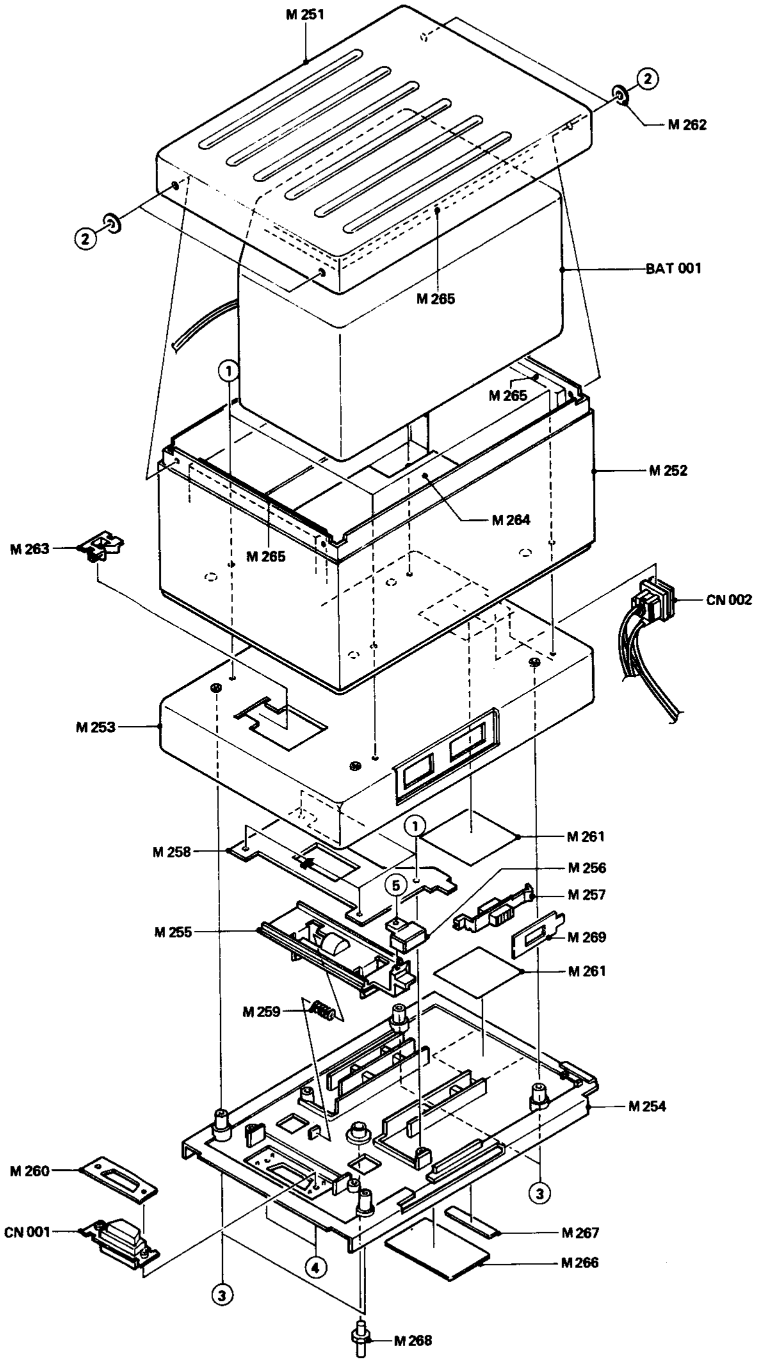
PACKAGING


M230,M231,M232
M233
M235
WV-VF30
M234
M235
M235

PCB001	YFVPKBVF30PA
PCB002	YFVPKQVF30PB
PCB003	YFVPKRVF30PB
V101	40CB4M
D101	LN33SGP−U
D102	LN23SRP−D
D103	LN43SYP
VR4	EVJ8KAS10B23
VR5	EVJ8KAS10B25
L101	ELY15V109B
CN101	YFS7506P610
CN2−PF	YFS7506P610
CN1	YFDEC9PF0
CN2−JM	EMCS0652M
M201	YFV5KB0004A2
M202	YFV5WB0005A4
M203	YFV4JA0002A4
M204	YFV1UA0001A4
M205	YFV5KB0003A2
M206	YFV1CA0001B4
M207	YFV1VA0001A4
M208	YFV1CA0002B4
M209	YFV3FA0001A3
M210	YFV5GA0001A3
M211	YWV3804WM02
M212	YFV2FA0007A4
M213	YVZC604WB01
M214	YFV3FA0002A3
M215	YFV3CA0001A4
M220	YFV5WA0044AS
M221	YFV5EA0005A4
M222	YFV5WA0043AS
M223	YFV2CA0013A3
M224	YFV5MA0003B3
M225	YFV7QA0190B4
M226	YVZC700RB50
M228	YWS−CULRB12
M239	YWS−WULRB03

M230	YFV8QA0165AN
M231	YW−B−RB01
M233	YWT20X35C03
M234	XZB26X40C05
M235	YFV9CA0121AN

EXPLODED VIEW OF BATTERY PACK



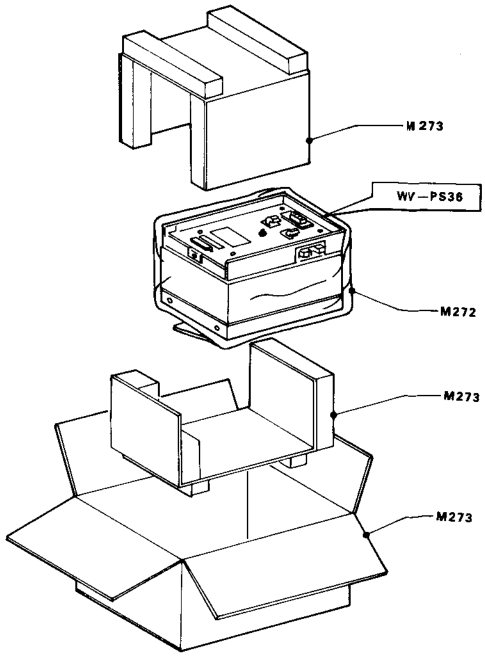
M 251
②
M 262
②
BAT 001
M 265
①
M 265
M 252
M 264
M 263
M 265
CN 002
M 253
①
M 261
M 258
M 256
⑤
M 257
M 255
M 269
M 261
M 259
M 254
M 260
③
M 267
CN 001
④
M 266
③
M 268

○ Numbers show Screws

No.	Screws	Description
①	XSB3+6FX	Binding Head Screws
②	XSB3+4FXK	Binding Head Black Screws
③	XSB3+16FXK	Binding Head Black Screws
④	XSS2+8FXK	Flush Head Machine Screws
⑤	XYN26+C6FX	Machine Screws and Washer Assembly

CN001	YFDECF9SF0
CN002	YWQMA1221B
BAT001	P4010A19
M251	YFV5EA0074A3
M252	YFV5KA0019A2
M253	YFV2SA0059A3
M254	YFV5EA0045C2
M255	YFV1BA0002A4
M256	YFV6JA0010A4
M257	YFV6JA0009A4
M258	YFV2CA0016A4
M259	YFV4JA0024C4
M260	YFV2SA0036A4
M261	YFV2PA0025A4
M262	YFV1KA0007A4
M263	YFEDS2
M264	YFV2FA0030A4
M265	YFV2FA0031A4
M266	YFV7QA0183A4
M267	YVZC700RB50
M268	YFV1HA0008A4
M269	YFV7SA0061A4

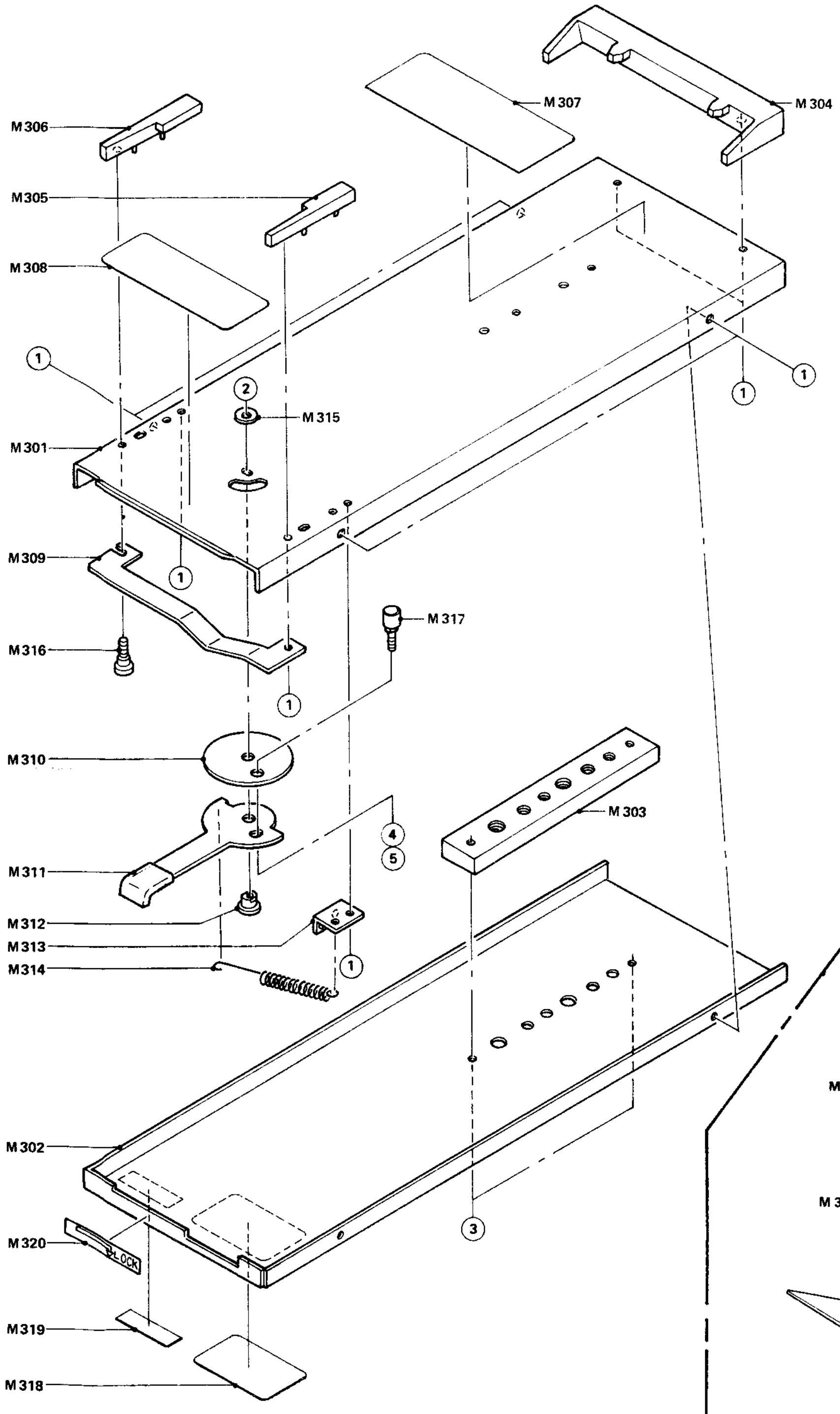
PACKAGING



M 273
WV−PS36
M272
M273
M273

M272	XZB26X40C05
M273	YFV9CA0120AN

EXPLODED VIEW OF TRIPOD MOUNTING ADAPTOR

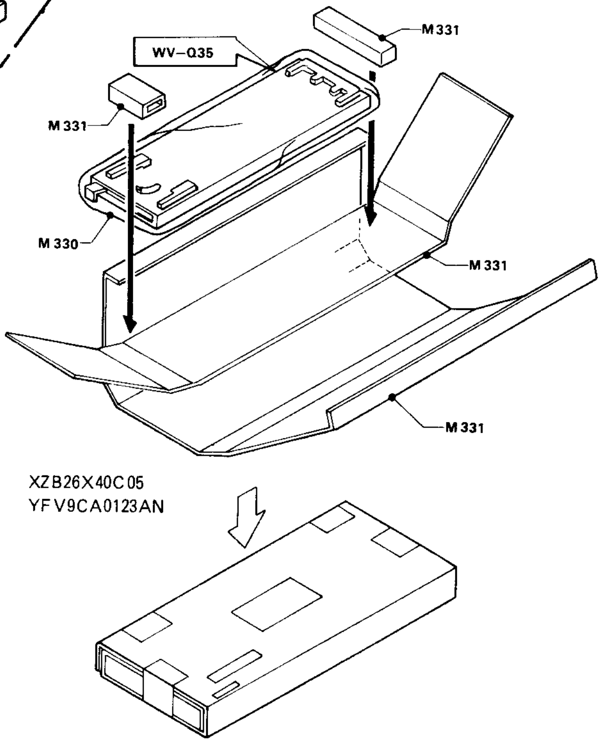

M306
M305
M308
①
M301
M309
M316
M310
M311
M312
M313
M314
M302
M320
LOCK
M319
M318
M307
M304
②
M315
M317
④
⑤
M303
③

○ Numbers show screws

No.	Screw	Description
①	XSB3+6FXK	Binding Head Black Screw
②	XSB4+6FXK	Binding Head Black Screw
③	XSS3+8FXK	Flush Head Machine Black Screw
④	XWA3BFC	Spring Lock Washer
⑤	XNG3HFC	Hexagon Heads Nut

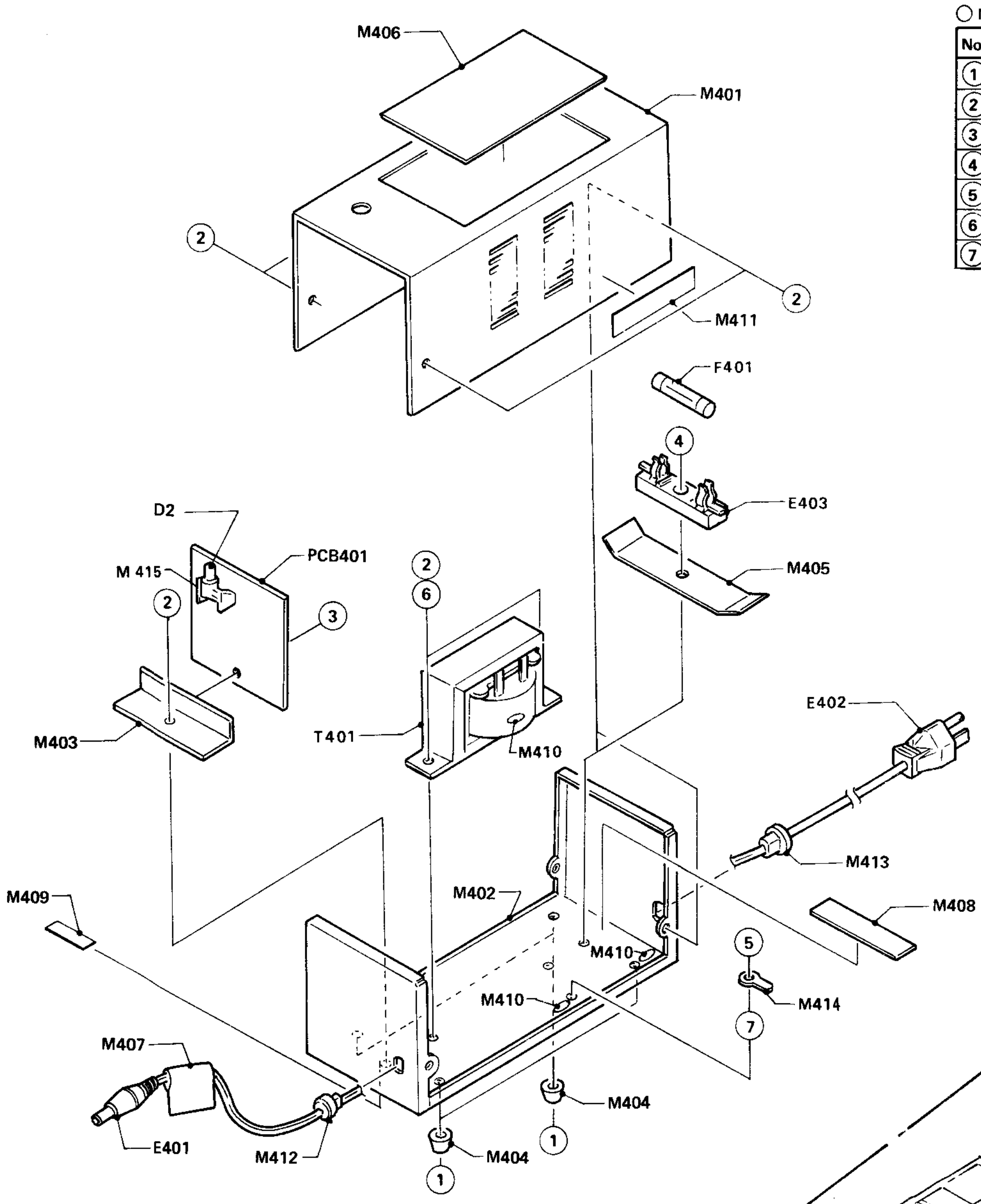
M301	YFV2TA0009B3
M302	YFV2TA0010B3
M303	YFV2CA0014A4
M304	YFV2EA0004B4
M305	YFV2EA0005B4
M306	YFV2EA0006B4
M307	YFV2NA0012A4
M308	YFV2NA0013A4
M309	YFV4JA0018B4
M310	YFV2NA0004B4
M311	YFV4RA0003B4
M312	YFV1EA0006B4
M313	YFV2TA0011A4
M314	YFV4JA0019B4
M315	YFV1KA0004A4
M316	YWV52-BM01
M317	YFV1EA0009A4
M318	YFV7QA0116A4
M319	YVZC700RB50
M320	YFV7SA0045A4

PACKAGING


WV-Q35
M331
M331
M330
M331
M331

M330	XZB26X40C05
M331	YFV9CA0123AN

EXPLODED VIEW OF BATTERY CHARGER

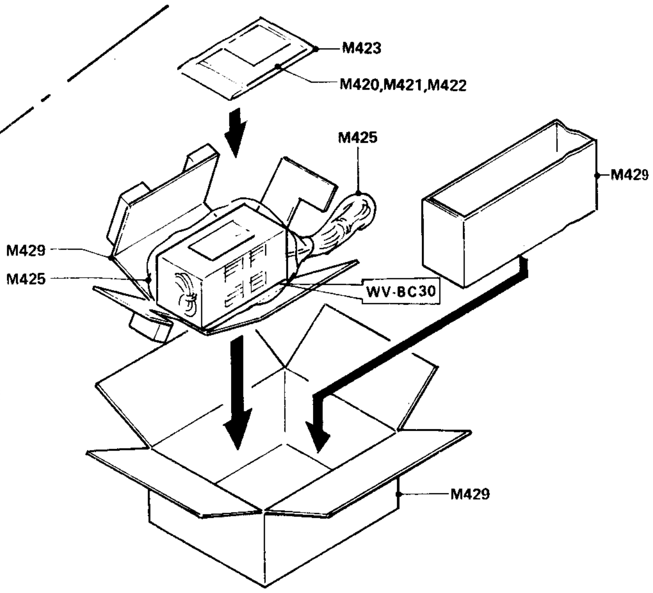

M406
M401
②
②
M411
F401
④
E403
D2
PCB401
M 415
②
③
②
⑥
M405
E402
M403
T401
M410
M413
M409
M402
M410
M410
M408
⑤
M414
⑦
M407
M404
①
E401
M412
M404
①

○ Numbers show Screws

No.	Screws	Description
①	XSB26+8FXK	Binding Head Biack Screw
②	XSB3+4FXK	Binding Head Black Screw
③	XSB3+6FXV	Binding Head Violet Screw
④	XSB3+8FXK	Binding Head Black Screw
⑤	XSB4+5FXK	Binding Head Black Screw
⑥	XWG3FX	Polished Round Plain Washer
⑦	XWC4BFX	External Toothed Lock Washer

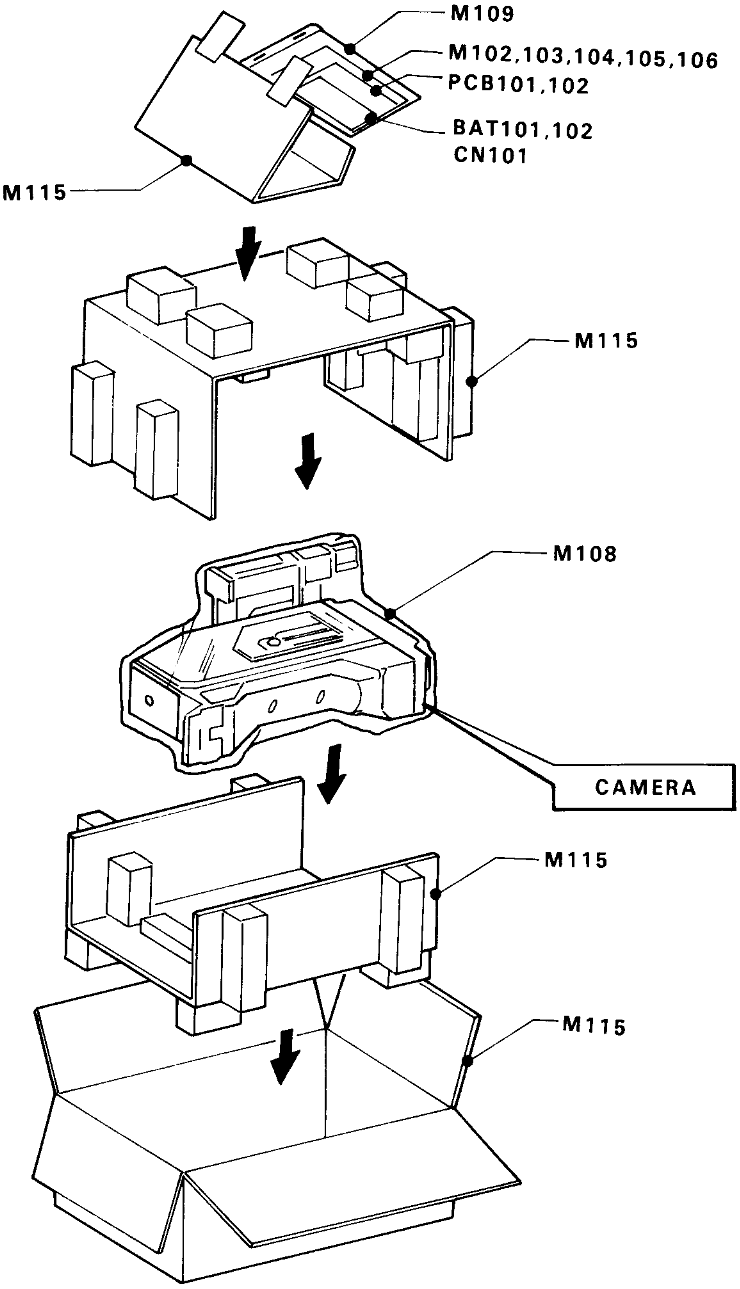
PCB401	YFVPKPBC30PA
D2	LN21RPH
T401	YFPHB48E007
F401	YFXB2C063TR0
E401	YFV0009-005
E402	YWKPLTSA-8
	YWHBS-3-08
	YWCE099-08F
	YWVM0099-08
E403	YWXN1157-03
M401	YFV5EA0073A3
M402	YFV2KA0036A3
M403	YFV2SA0058A4
M404	YFV5LA0001A4
M405	YFV2PA0024A4
M406	YFV7QA0185A4
M407	YFV7SA0052A4
M408	YFV7SA0068A4
M409	YVZC700RB50
M410	YW-BCG-UR01B
M411	YWS-CULRB12
M412	YWSR2P4
M413	YWSR6W-1
M414	YW-BCG-EM01
M415	YWE6400FR09

PACKAGING


M423
M420,M421,M422
M425
M429
M429
M425
WV-BC30
M429

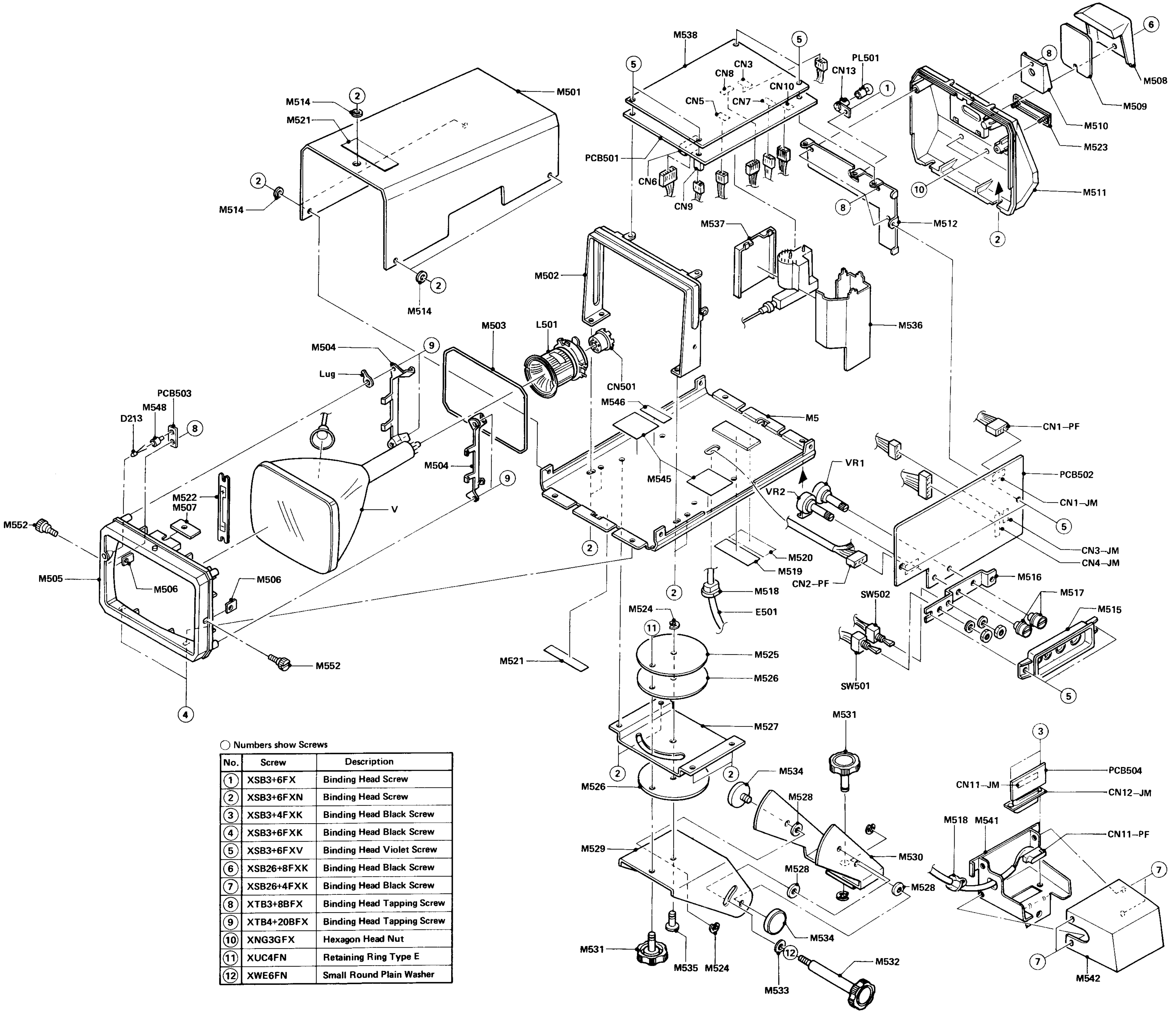
M420	YFV8QA0114AN
M422	YW-B-RB01
M423	TWT26X40C05
M425	TWT20X35C03
M429	YFV9CA0134AN

PACKAGING


M109
M102,103,104,105,106
PCB101,102
BAT101,102
CN101
M115
M115
M108
CAMERA
M115
M115

EXPLODED VIEW OF 5″ VIEWFINDER

PCB501	YFVPKB0035FA	M509	YWV385PLR01U
PCB502	YFVPKC0035FA	M510	YWV3805AM02
PCB503	YFVPKE0035PA	M511	YFV5EA0067A2
PCB504	YFVPKF0035PA	M512	YWV3805CM02
V1	140BRB4	M513	YFV5EA0064A2
D501	LN23L	M514	YFV1KA0001A4
VR1	EVHC0AK15B53	M515	YFV5WA0060A3
VR2	EVHC0AK15B15	M516	YFV2SA0046A4
L501	YS-32971	M517	YWV3801HR01
SW1, 2	YFM2012ESG	M518	YWSR5N4
PL1	YWS9G1012V12	M519	YFV7QA0111A4
E501	YWKPLTSA-8	M520	YVZC700RB50
	YWHBS-3-08	M521	YFV7SA0023A4
	YWCE099-08F	M522	YWV3805UR02
	YWVM0099-08	M523	YWS-LM010A
CN10	YWS7-502B-40	M524	YFBE-40
CN11-PF	YFVCN0064A	M525	YFV2CA0019A4
CN13	YWM20201A	M526	YFV2NA0009A4
CN1-JM	EMCS0452M	M527	YFV2TA0012A4
CN2-JM,	EMCS0352M	M528	YFV2NA0008A4
3-JM		M529	YFV2WA0004A3
CN4-JM	EMCS0552M	M530	YFV2WA0005A3
CN5-JM	EMCS0352M	M531	YFV5RA0014A4
CN6-JM	EMCS0452M	M532	YFV5RA0015A3
CN7-JM	EMCS0352M2G	M533	YWV1800FR03
CN8-JM	EMCS0252M	M534	YFV1BA0003A4
CN9-JM	EMCS0252M1R	M535	YFV1BA0004A4
M501	YFV5EA0063A3	M536	YFV2HA0054A3
M502	YWV3805CM01	M537	YFV2HA0055A4
M503	YWV5200WM01	M538	YFV2PA0026A4
M504	YWV3805AM01	M541	YFV5EA0062A3
M505	YWV3805DR01	M542	YFV5EA0061A3
M506	YWV3805LM02	M545	YWS-WULBC4
M507	YWV930-LM01	M546	YFV7MA0017A4
M508	YWV385PKR01V	M548	YWE2400FR01


M538
CN3
CN8
CN13
PL501
CN10
CN5
CN7
PCB501
CN6
CN9
M501
M514
M521
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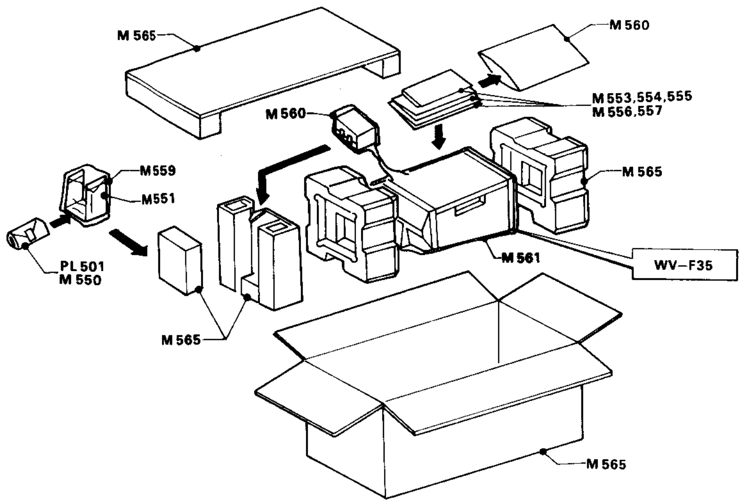
M509
M510
M523
M511
M512
M537
M502
M536
M503
L501
M504
Lug
CN501
M546
M5
PCB503
M548
D213
M545
M522
M507
V
M552
M505
M506
VR1
VR2
PCB502
CN1-PF
CN1-JM
CN3-JM
CN4-JM
M520
M519
CN2-PF
M518
E501
M516
M517
M515
SW502
SW501
M524
M525
M526
M521
M527
M531
M534
M528
M530
M529
M535
M533
M532
M542
PCB504
CN11-JM
CN12-JM
M541
CN11-PF

○ Numbers show Screws

No.	Screw	Description
①	XSB3+6FX	Binding Head Screw
②	XSB3+6FXN	Binding Head Screw
③	XSB3+4FXK	Binding Head Black Screw
④	XSB3+6FXK	Binding Head Black Screw
⑤	XSB3+6FXV	Binding Head Violet Screw
⑥	XSB26+8FXK	Binding Head Black Screw
⑦	XSB26+4FXK	Binding Head Black Screw
⑧	XTB3+8BFX	Binding Head Tapping Screw
⑨	XTB4+20BFX	Binding Head Tapping Screw
⑩	XNG3GFX	Hexagon Head Nut
⑪	XUC4FN	Retaining Ring Type E
⑫	XWE6FN	Small Round Plain Washer

PACKAGING


M 565
M 560
M 553,554,555
M 556,557
M 560
M 559
M 551
M 565
PL 501
M 550
M 561
WV-F35
M 565
M 565

PL501	YWS9G1012V12	M557	YWV385PLR03U
M550	YFV5MA0005A4	M558	YWT10X10C03
M551	YWV3805KM03	M559	YWT20X35C03
M552	YWV3805FM01	M560	XZB26X40C05
M553	YFV8QA0092AN	M561	XZB35X50C05
M554	VQA0120-2	M562	YWT10X16C03
M555	YWV22XPRB99G	M565	YFV9CA0118AN
M556	YWV385PLR02U		

EXPLODED VIEW OF RCU

PCB601	YFVPKP0030PB
PCB602	YFVPKR0030PA
PCB603	YFVPKB0030PA
PCB604	YFVPKC0030PA
Q124	2SA1065
Q154	2SC2792
D21	LN21RPH
D22	LN31-GCP
D39	ESAB82-004
VR44	EVHC0HK20B14
VR45	EVHC0AK20B13
VR46	EWKENAS20B13
VR47	EVHC0AS15B53
T1	YFHPB60E008
SW1	EST-1554
SW2	YFM2028ES
SW3	YFM2012ES
SW4	YFM2012ESG
SW5	YFSBU1024
SW6	YFSRN1024
SW7,8	YFM023ESG
SW9,10	YFM2012ESG
SW11,12	YSTS-J0284-4
CN31~40	YWBNC-R
CN41	YYJMBP2532
CN42	YWAA-34
CN43	YWLJ194-1-1
CN44	YWS2-104WIS0
CN45	YWKPLTSA-8
	YWHBS-3-08
	YWCE099-08F
	YWVM0099-08
CN1-JM	EMCS0352M
CN2-JM	EMCS0352MIR
CN3-JM ~ 7-JM	EMCS0352M
CN8-JM	EMCS0452M
CN9-JM ~ 13-JM	EMCS0352M
CN14-JM	EMCS0352M1R

CN15-JM	EMCS0852M
CN16-JM, 17-JM	EMCS0352M
CN18-JM, 19-JM	EMCS0352M1R
CN20-JM	EMCS0352M1G
CN21-JM	EMCS0552M
CN22-JM	EMCS0352M1G
CN23-JM	EMCS0652M
CN24-JM	EMCS0352M
CN25-JM	EMCS1052M
CN26-JM	EMCS0352M
CN27-JM	EMCS0452M
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CN2-PF	EMCM0337BR2S
CN3-PF	EMCM0347B53S
CN4-PF	EMCM0320B53S
CN5-PF	EMCM0337B53S
CN6-PF	EMCM0343B53S
CN7-PF	EMCM0316B52S
CN8-PF	EMCM0419B52W
CN9-PF	EMCM0308B52S
CN10-PF	EMCM0316B52S
CN11-PF	EMCM0314B52S
CN12-PF	EMCM0351D52S
CN13-PF	EMCM0353D52S
CN14-PF	EMCM0373DR2S
CN15-PF	EMCM0831D52W
CN16-PF	EMCM0322B52S
CN17-PF	EMCM0333B53S
CN18-PF	EMCM0335DR2S
CN19-PF	EMCM0315DR5
CN20-PF	EMCM0313DG5
CN21-PF	EMCM0531D52S
CN22-PF	EMCM0313DG2S
CN23-PF	EMCM0630D52S
CN24-PF	EMCM0322D55
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CN27-PF	EMCM0413D52W
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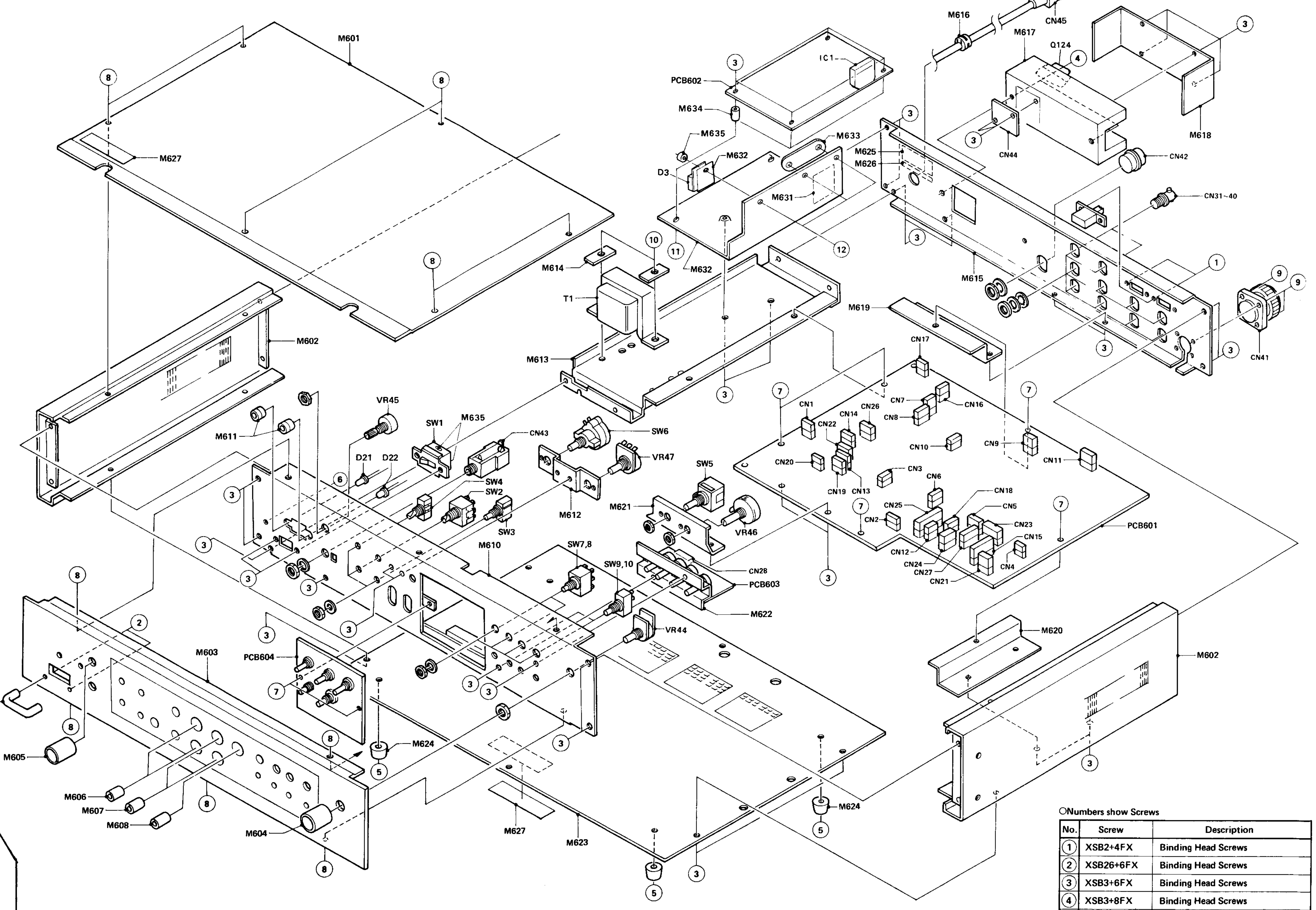
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M627
M602
M611
VR45
SW1
M635
CN43
SW6
VR47
D21
D22
SW4
SW2
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M610
SW7,8
SW9,10
M621
SW5
VR46
CN28
PCB603
M622
VR44
M603
PCB604
M604
M605
M606
M607
M608
M624
M623
M627
M620
M602
M624
T1
M614
M613
M632
D3
M635
M634
PCB602
IC1
M633
M631
M625
M626
M616
M617
Q124
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CN44
CN42
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M615
M619
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CN17
CN1
CN14
CN26
CN7
CN8
CN16
CN22
CN10
CN9
CN11
CN20
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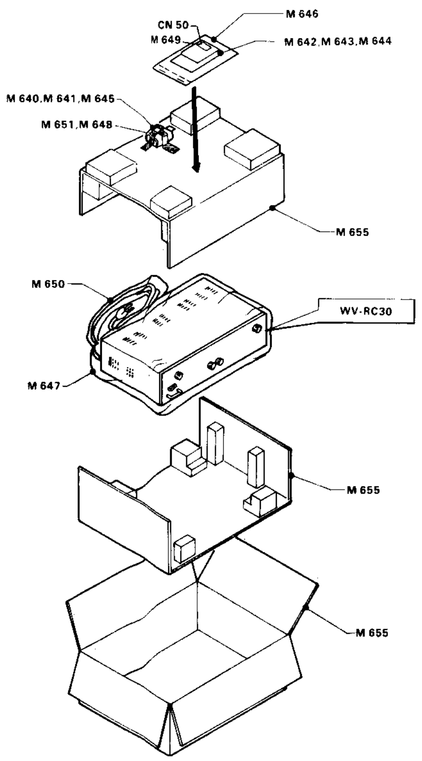
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M 649
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M 651,M 648
M 655
M 650
WV-RC30
M 647
M 655
M 655

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M640	YWB350-HM01
M641	YWU-L88HA
M642	YFV8QA0162AN
M644	YW-B-RB01
M646	XZB26X40C05
M647	XZB45X63C05
M648	YWT050803
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M650	YWT20X25C03
M651	YWT15X20C03
M655	YFV9CA0115AN

M601	YFV5EA0059A3
M602	YFV5EA0058A2
M603	YFV5WA0058A4
M604	YFV5DA0005A4
M605	YFV5RA0012A3
M606	YWV8310HR11
M607	YWV8310HR12
M608	YFV5RA0013A4
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M611	YWJ800PWB01
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M614	YWV5350LM04
M615	YFV5WA0059A2
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M621	YFV2SA0039B4
M622	YFV2SA0038A4
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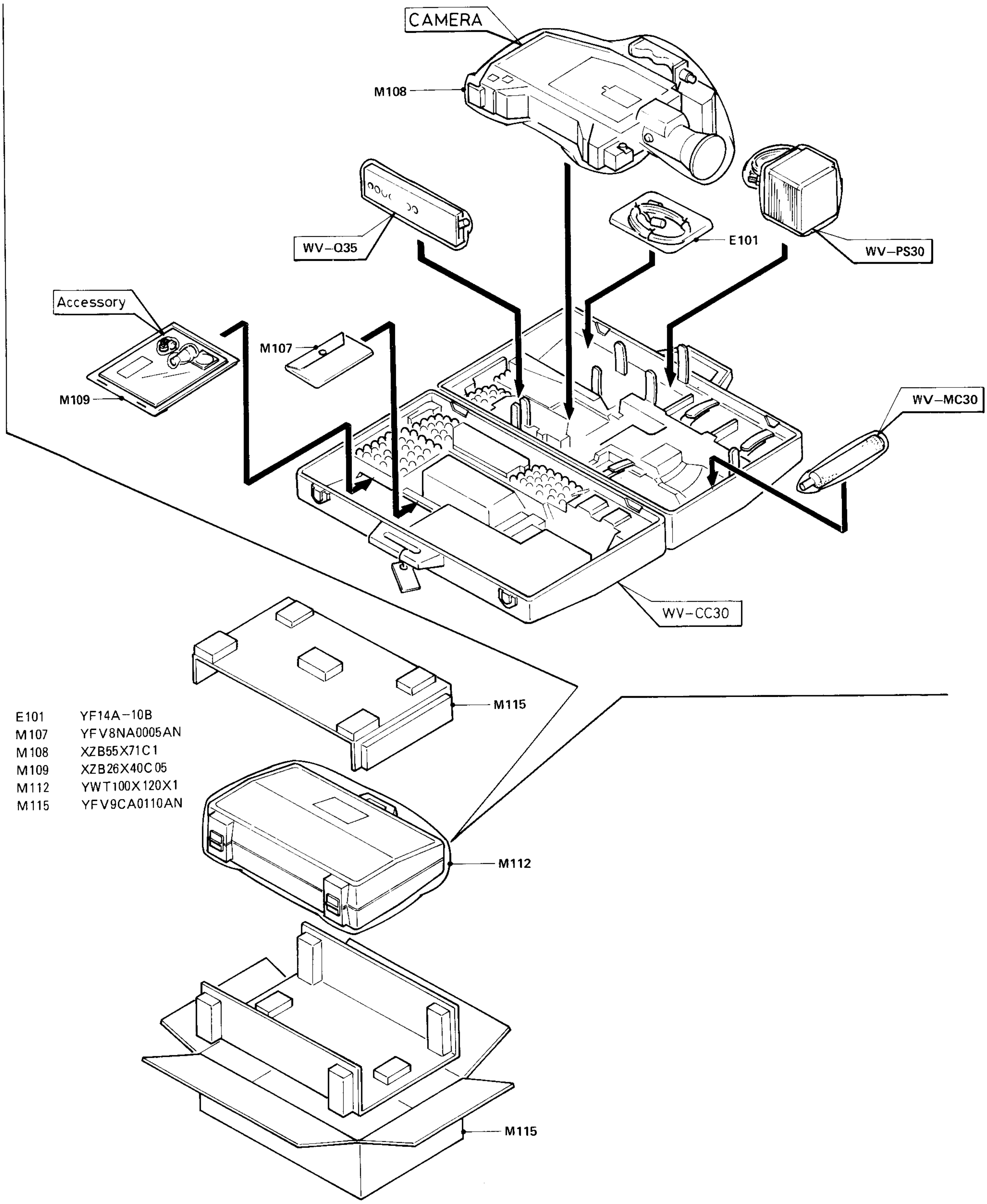
M624	YWV5350WB01
M625	YFV7QA0186A4
M626	YVZC700RB50
M627	YWS-CULRB08
M630	YF4ER03070
M631	YF4ER03072
M632	YF3ER03067
M633	YF4ER03068
M635	YW-BCG-UR01B

○Numbers show Screws

No.	Screw	Description
①	XSB2+4FX	Binding Head Screws
②	XSB26+6FX	Binding Head Screws
③	XSB3+6FX	Binding Head Screws
④	XSB3+8FX	Binding Head Screws
⑤	XSB3+10FX	Binding Head Screws
⑥	XSB4+6FX	Binding Head Screws
⑦	XSB3+6FXV	Binding Head Violet Screws
⑧	XSB3+6FXK	Binding Head Black Screws
⑨	XSN3+8FXK	Pan Head Machine Black Screws
⑩	XYN4+A8FX	Machine Screw and Washer Screws
⑪	XSS3+6FX	Flush Head Screws
⑫	XYN4+A15FX	Machine Screw and Washer Screws

PACKAGING


CAMERA
M108
WV-Q35
E101
WV-PS30
Accessory
M107
M109
WV-MC30
WV-CC30
M115
M112
M115

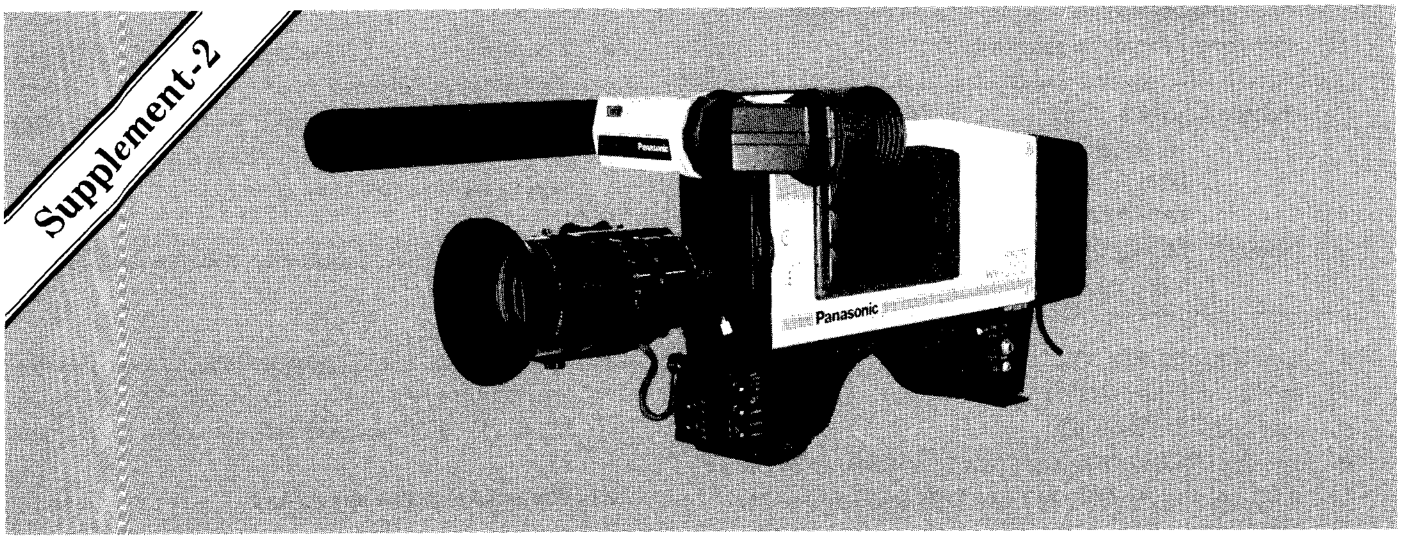
E101	YF14A-10B
M107	YFV8NA0005AN
M108	XZB55X71C1
M109	XZB26X40C05
M112	YWT100X120X1
M115	YFV9CA0110AN

ORDER NO. VKD83040757S8

Service Manual

Colour Video Camera

WV-777 Series



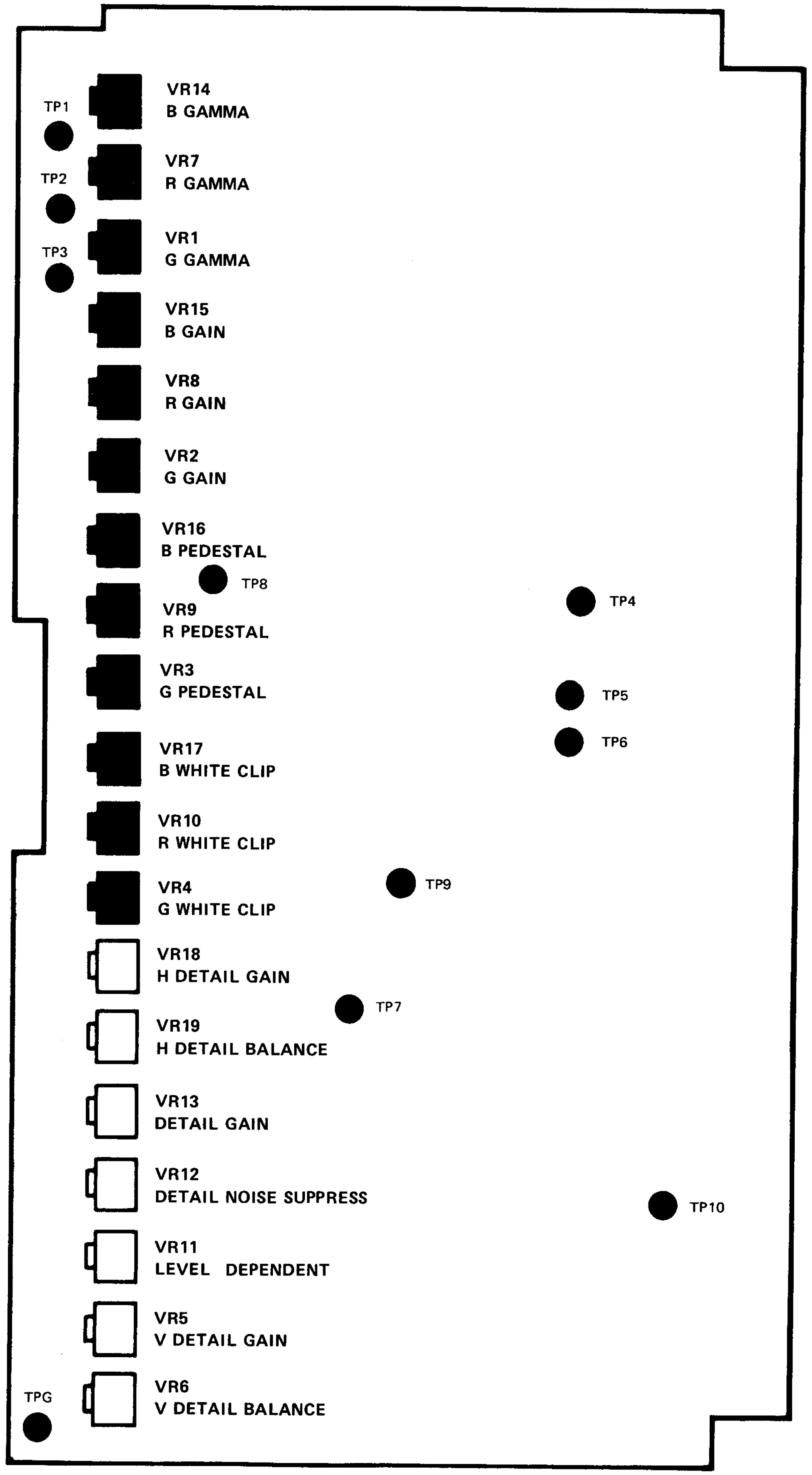
- The process-2 board has been improved to clear contour lines for the aperture signal circuit from serial No. 32A00001 and higher.
- The process-2 board has been changed form YFVPKP777F1A assembly to YFVPKP777F7A assembly.
- Please file this supplement service manual with the service manual Order No. VKD82100662C8.

Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

LOCATION OF TEST POINTS AND ADJUSTING CONTROLS

PROCESS-2 BOARD — Component Side —


TP1
TP2
TP3
VR14
B GAMMA
VR7
R GAMMA
VR1
G GAMMA
VR15
B GAIN
VR8
R GAIN
VR2
G GAIN
VR16
B PEDESTAL
TP8
VR9
R PEDESTAL
TP4
VR3
G PEDESTAL
TP5
TP6
VR17
B WHITE CLIP
VR10
R WHITE CLIP
VR4
G WHITE CLIP
TP9
VR18
H DETAIL GAIN
TP7
VR19
H DETAIL BALANCE
VR13
DETAIL GAIN
VR12
DETAIL NOISE SUPPRESS
TP10
VR11
LEVEL DEPENDENT
VR5
V DETAIL GAIN
TPG
VR6
V DETAIL BALANCE

Adjustment after replacing the new Process-2 board

(a) Replacement of Process-2 board

- Turn OFF the power switch.
- Remove the right side cover (viewed from the front) by loosening the four fixing screws.
- Replace the Process-2 board to the new one.
- Turn ON the power switch.

(b) Horizontal centering adjustment

Adjusts :	VR42 (R H-CENTERING)	Deflection board
	VR41 (B H-CENTERING)	Deflection board
Observe :	Monochrome underscanned video monitor	

- Connect the PIX OUT connector on the rear of camera to the VIDEO IN of monochrome underscanned video monitor.
- Set the REGISTRATION SWITCH SW2 to the R position and -G ON/OFF SWITCH SW3 to the ON position in order to observe the R-G picture. (Fig. 1)

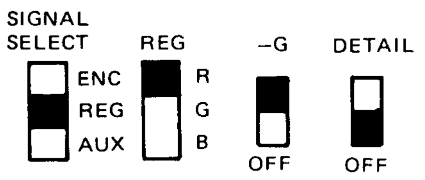
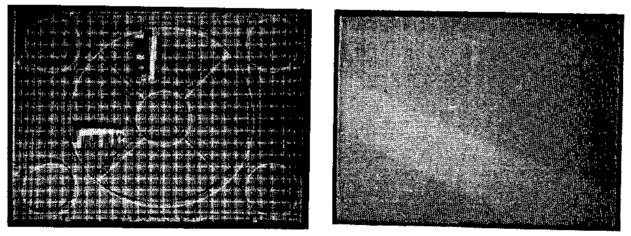

SIGNAL SELECT
ENC
REG
AUX
REG
R
G
B
−G
OFF
DETAIL
OFF

Fig. 1

- Aim the camera at the registration chart and set the lens iris to F4.
- Adjust R H-CENTERING VR42 so that the red (black line) and green (white line) picture coincide with each other over the entire raster. (Fig. 2)



NO GOOD GOOD

Fig. 2

- Set the REGISTRATION SWITCH SW2 to the B position in order to observe the B-G picture.
- Adjust B H-CENTERING VR41 so that the blue (black line) and green (white line) picture coincide with each other over the entire raster.

(c) Confirmation of input gain adjustment

- Confirm that the G, R and B signal at TP3, TP2 and TP1 on the Process-2 board are 1.6Vp-p. If not, adjust G INPUT GAIN VR1, R INPUT GAIN VR3 and B INPUT GAIN VR5 respectively while referring to (a) Input gain adjustment.

(d) Confirmation of G gamma, pedestal and gain adjustment

- Confirm that the G gamma, pedestal and gain are adjusted property. If not fine-adjust then referring to (j) G gamma, pedestal and gain adjustment

(e) White balance fine adjustment

- Fine-adjust the white balance while referring to (m) White balance fine adjustment.

4-8 Adjustment of Process-1 and Process-2 Board

(a) Input gain adjustment

Test points :	TP3 (G)	Process-2 board
	TP2 (R)	Process-2 board
	TP1 (B)	Process-2 board
Adjusts :	VR1 (G INPUT GAIN)	Process-1 board
	VR3 (R INPUT GAIN)	Process-1 board
	VR5 (B INPUT GAIN)	Process-1 board

- Aim the camera at the logarithmic gray scale chart and set the lens iris to F4.
- Set the High Gain Selection Switch to 0 dB position.
- Connect the oscilloscope to TP3 on the Process-2 board and trigger the oscilloscope at H rate (Use TP17, Mother board).

- Adjust G INPUT GAIN VR1 on the Process-1 board for 1.6Vp-p. (Fig. 4-8-1)

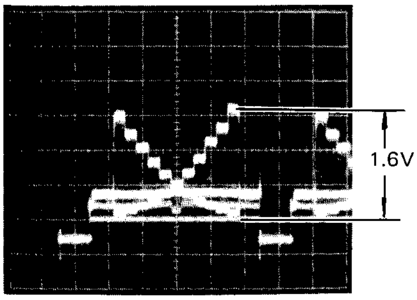


Fig. 4-8-1

- Connect the oscilloscope to TP2 on the Process-2 board and adjust R INPUT GAIN VR3 on the Process-1 board for 1.6Vp-p.
- Connect the oscilloscope to TP1 on the Process-2 board and adjust B INPUT GAIN VR5 on the Process-1 board for 1.6Vp-p.

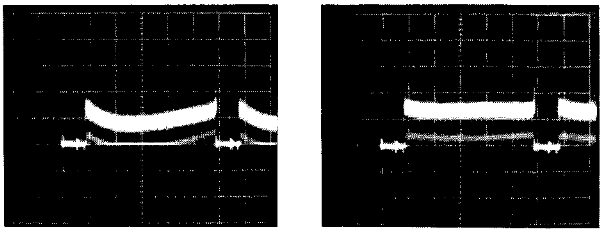
(b) Dark shading adjustment

Test points :	TP3 (G)	Process-2 board
	TP2 (R)	Process-2 board
	TP1 (B)	Process-2 board
Adjusts :	VR30 (G V-SAWTOOTH)	Deflection board
	VR31 (G V-PARABOLA)	Deflection board
	VR32 (G H-SAWTOOTH)	Deflection board
	VR33 (G H-PARABOLA)	Deflection board
	VR35 (R V-SAWTOOTH)	Deflection board
	VR36 (R V-PARABOLA)	Deflection board
	VR37 (R H-SAWTOOTH)	Deflection board
	VR38 (R H-PARABOLA)	Deflection board
	VR25 (B V-SAWTOOTH)	Deflection board
	VR26 (B V-PARABOLA)	Deflection board
	VR27 (B H-SAWTOOTH)	Deflection board
	VR28 (B H-PARABOLA)	Deflection board

- Close the lens iris or set the filter wheel to the position 4.
- Set the High Gain Selection Switch to the +12dB position.

■ G dark shading adjustment

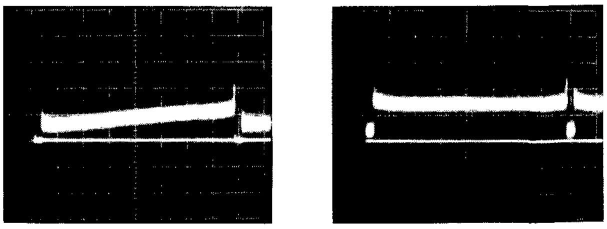
- Connect the oscilloscope to TP3 on the Process-2 board and trigger the oscilloscope at H rate (Use TP17, Mother board).
- While observing the waveform adjust DARK SHADING, G H-SAWTOOTH VR32 and G H-PARABOLA VR33 on the Deflection board to make the dark waveform as flat as possible. (Fig. 4-8-2)



NO GOOD GOOD

Fig. 4-8-2

- After above adjustment, trigger the oscilloscope at V rate (Use TP19, Mother board).
- Adjust G V-SAWTOOTH VR30 and G V-PARABOLA VR31 to make the dark waveform as flat as possible. (Fig. 4-8-3)



NO GOOD GOOD

Fig. 4-8-3

- Adjust R and B dark shading in the same manner.

■ R dark shading adjustment

- Connect the oscilloscope to TP2 on the Process-2 board and trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust DARK SHADING, R H-SAWTOOTH VR37 and R H-PARABOLA VR38 on the Deflection board to make the dark waveform as flat as possible as in the case of G dark shading adjustment. (Fig. 4-8-2)
- Trigger the oscilloscope at V rate (Use TP19, Mother board).
- Adjust R V-SAWTOOTH VR35 and R V-PARABOLA VR36 to make the dark waveform as flat as possible. (Fig. 4-8-3)

■ B dark shading adjustment

- Connect the oscilloscope to TP1 on the Process-2 board and trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust DARK SHADING, B H-SAWTOOTH VR27 and B H-PARABOLA VR28 on the Deflection board to make the waveform as flat as possible as in the case of G dark shading adjustment. (Fig. 4-8-2)
- Trigger the oscilloscope at V rate (Use TP19, Mother board).
- Adjust B V-SAWTOOTH VR25 and B V-PARABOLA VR26 to make the waveform as flat as possible. (Fig. 4-8-3)

(c) Blanking offset adjustment

Test points :	TP3 (G)	Process-2 board
	TP2 (R)	Process-2 board
	TP1 (B)	Process-2 board
Adjusts :	VR29 (G BL OFFSET)	Deflection board
	VR34 (R BL OFFSET)	Deflection board
	VR24 (B BL OFFSET)	Deflection board

- Confirm that the Deflection board is fixed to the main chassis with two screws.
- Close the lens or set the filter wheel to the position 4.

■ G blanking offset adjustment

- Connect the oscilloscope to TP3 on the Process-2 board and trigger the oscilloscope at H rate (Use TP17, Mother board).
- Set the High Gain Selection Switch on the side of camera to the 0dB position and note the pedestal level at TP3.
- Set the High Gain Selection Switch to the +12dB position and adjust G BL OFFSET VR29 on the Deflection board so that the pedestal level at TP3 is same as the noted level. (Fig. 4-8-4)

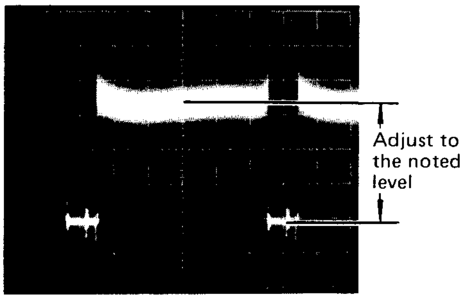


Fig. 4-8-4

- Set the Selection Switch to the 0dB position and note the pedestal level again.
- Set the Selection Switch to the +12dB position again and readjust VR29 so that the pedestal level is same as the noted level.
- Repeat this procedure until the pedestal level stays same at the 0dB and +12dB position. (Fig. 4-8-5)

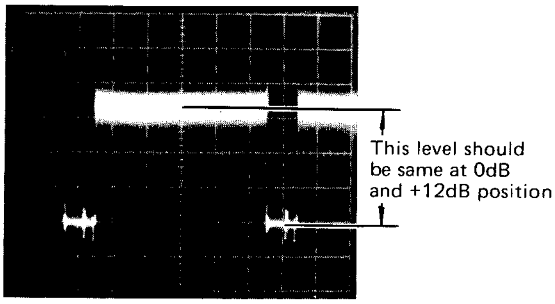


Fig. 4-8-5

- Adjust R and B blanking offset in the same manner.

■ R blanking offset adjustment

- Adjust R BL OFFSET VR34 on the Deflection board as in the case of G blanking offset adjustment so that the pedestal level at TP2 on the Process-2 board stays same at the 0dB and +12dB position of the High Gain Selection Switch.

■ B blanking offset adjustment

- Adjust B BL OFFSET VR24 on the Deflection board as in the case of G blanking offset adjustment so that the pedestal level at TP1 on the Process-2 board stays same at the 0dB and +12dB position of High Gain Selection Switch.

(d) Pedestal preset adjustment

Test points :	TP3 (G)	Process-2 board
	TP2 (R)	Process-2 board
	TP1 (B)	Process-2 board
Adjusts :	VR2 (G PEDESTAL PRESET)	Process-1 board
	VR4 (R PEDESTAL PRESET)	Process-1 board
	VR6 (B PEDESTAL PRESET)	Process-1 board

- Close the lens iris or set the filter wheel to the position 4.
- Set the High Gain Selection Switch to the 0dB position.
- Connect the oscilloscope to TP3 on the process-2 board and trigger oscilloscope at H rate (Use TP17, Mother board).

- Adjust G PEDESTAL PRESET VR2 so that the G pedestal level is 0.2V. (Fig. 4-8-6)

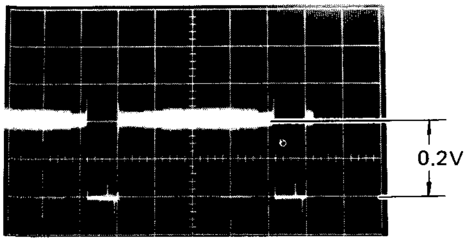


Fig. 4-8-6

- Connect the oscilloscope to TP2 on the process-2 board and adjust B PEDESTAL PRESET VR4 so that the B pedestal level is 0.2V as in case of G pedestal preset adjustment.
- Connect the oscilloscope to TP1 on the process-2 board and adjust R PEDESTAL PRESET VR6 so that the R pedestal level is 0.2V as in case of G pedestal preset adjustment.

(e) Vertical detail (aperture) balance and gain adjustment

Test point :	TP7	Process-2 board
Adjusts :	VR5	Process-2 board
	(V DETAIL GAIN)	
	VR6	Process-2 board
	(V DETAIL BALANCE)	

- Aim the camera at the window scale chart and set the lens iris to F5.6.
- Connect the oscilloscope to TP7 and trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust V DETAIL BALANCE VR6 to cancel the video signal. (Fig. 4-8-7)

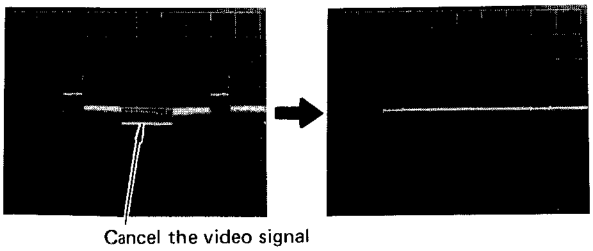


Fig. 4-8-7

- Trigger the oscilloscope at V rate (Use TP19, Mother board).

  Adjust V DETAIL GAIN VR5 so that the vertical detail (aperture) signal is 140mV. (Fig. 4-8-8)

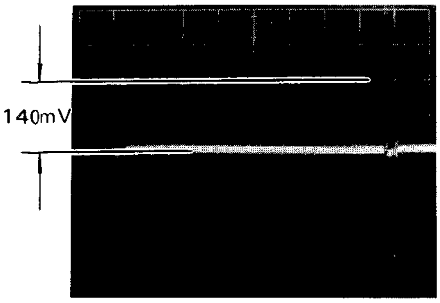


Fig. 4-8-8

(f) Horizontal detail (aperture) balance and gain adjustment

Test point :	TP8	Process-2 board
Adjusts :	VR18	Process-2 board
	(H DETAIL GAIN)	
	VR19	Process-2 board
	(H DETAIL BALANCE)	

- Aim the camera at the window chart and set the lens iris to F5.6.
- Connect the oscilloscope to TP8 and trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust H DETAIL BALANCE VR19 to cancel the video signal. (Fig. 4-8-9)

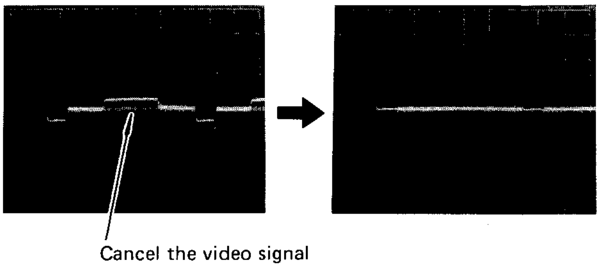


Fig. 4-8-9

- Adjust H DETAIL GAIN VR18 so that the horizontal detail (aperture) signal A+B is 220mV. (Fig. 4-8-10)

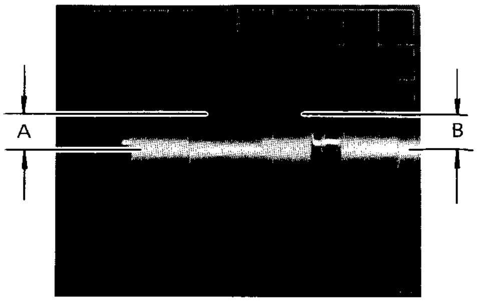


Fig. 4-8-10

(g) Detail (aperture) noise suppress adjustment

Test point :	TP9	Process-2 board
Adjust :	VR12	Process-2 board
	(DETAIL NOISE SUPPRESS)	
	VR13	Process-2 board
	(DETAIL GAIN)	
	VR11	Process-2 board
	(LEVEL DEPENDENT)	

- Set the Detail ON/OFF Switch SW4 on the Switch board of Deflection board to the ON (upper) position.
- Aim the camera at the logarithmic gray scale chart and set the lens iris to F5.6.

- Turn DETAIL GAIN VR13 fully clockwise and LEVEL DEPENDENT VR11 fully counterclockwise.
- Turn DETAIL NOISE SUPPRESS VR12 fully counterclockwise to release the suppression and note the noise level. (Fig. 4-8-11)

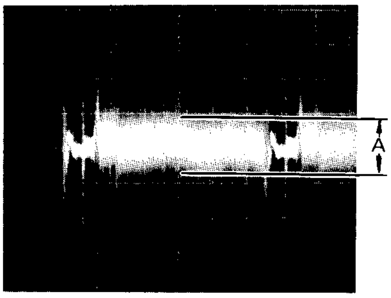


Fig. 4-8-11

- Adjust DETAIL NOISE SUPPRESS VR12 so that the noise level is 70% of the noted level. (Fig. 4-8-12)

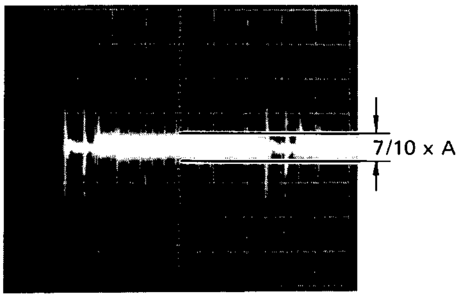


Fig. 4-8-12

(h) Level dependent adjustment

Test point :	**VIDEO OUT**	
Adjust :	**VR11** **(LEVEL DEPENDENT)**	**Process-2 board**

- Aim the camera at the gray scale chart and set the lens iris to F4.
- Connect the oscilloscope to the terminated VIDEO OUT signal or connect the VIDEO OUT to the waveform monitor.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust LEVEL DEPENDENT VR11 so that the noise on the lowest and 1st step of the gray scale waveform is suppressed. (Fig. 4-8-13)

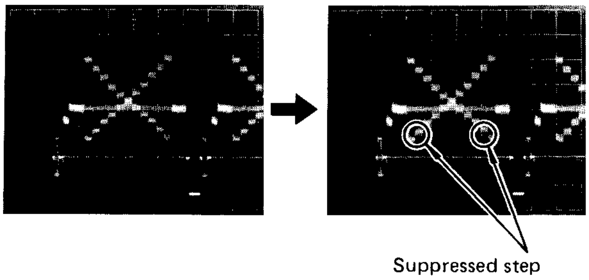


Fig. 4-8-13

(i) Detail (aperture) level adjustment

Test point :	**TP5**	**Process-2 board**
Adjust :	**VR13** **(DETAIL GAIN)**	**Process-2 board**
	VR18 **(H DETAIL GAIN)**	**Process-2 board**

- Aim the camera at the window chart and set the lens iris to F5.6.
- Connect the oscilloscope to TP5 and trigger the oscilloscope at V rate (Use TP19, Mother board).
- Adjust DETAIL GAIN VR13 so that the vertical detail (aperture) signal is 40% higher than the G signal A. (Fig. 4-8-14)

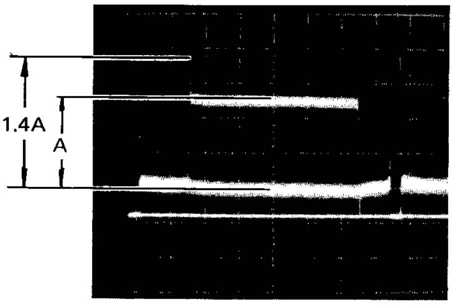


Fig. 4-8-14

- Trigger the oscilloscope at H rate (Use TP17, Mother board).

- Adjust H DETAIL GAIN VR18 so that the horizontal detail (aperture) signal (C+D)/2 is 20% high than the G signal A. (Fig. 4-8-15)

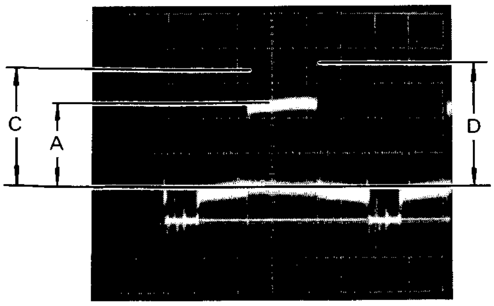


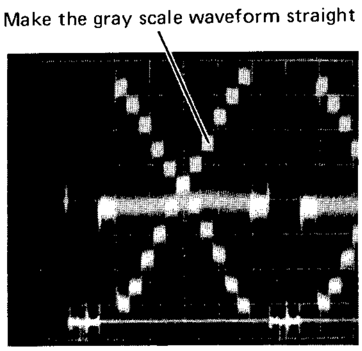
Fig. 4-8-15

- After adjusting the next step, confirm the detail (aperture) level adjustment.
- Reset the detail ON/OFF switch to the OFF position.

(j) G gamma, pedestal and gain adjustment

Test point :	TP5	Process-2 board
Adjusts :	VR1 (G GAMMA)	Process-2 board
	VR2 (G GAIN)	Process-2 board
	VR3 (G PEDESTAL)	Process-2 board

- Aim the camera at the logarithmic gray scale chart and set the lens iris to F4.
- Connect the oscilloscope to TP5 and trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust G GAMMA VR1 so that the gray scale waveform is straight. (Fig. 4-8-16)



Make the gray scale waveform straight

Fig. 4-8-16

- The gamma adjustment can be done while observing the waveform monitor.
- Connect the PIX OUT to the waveform monitor.
- Set the switches on the Switch board of Deflection board as shown below in order to observe the G signal waveform on the waveform monitor. (Fig. 4-8-17)

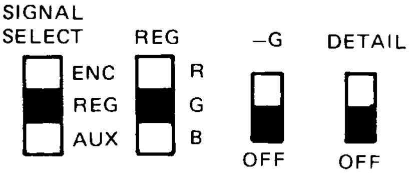


Fig. 4-8-17

- Adjust G GAMMA VR1 so that the top step of gray scale waveform becomes 100IRE unit when the black step (lowest step) and the 5th step (crossing step) of gray scale waveform are positioned at 15 and 60IRE unit respectively by adjusting the vertical position and variable voltage (calibration) controls on the waveform monitor. (Fig. 4-8-18)

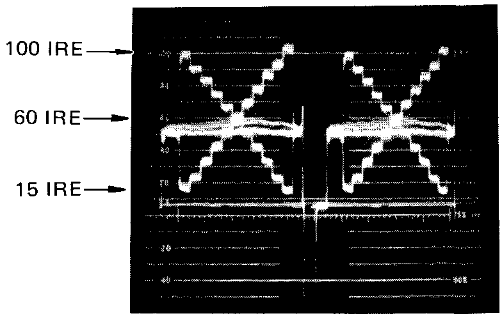
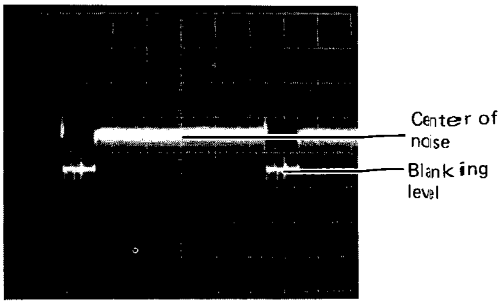


Fig. 4-8-18

- Close the lens or set the filter wheel to the position 4.
- Connect the oscilloscope to TP5.
- Turn G PEDESTAL VR3 clockwise to observe the signal as shown in Fig. 4-8-19. Turn VR3 back until the pedestal level is zero (The blanking level coincides with the center of noise.). (Fig. 4-8-20)



Center of noise

Blanking level

Fig. 4-8-19

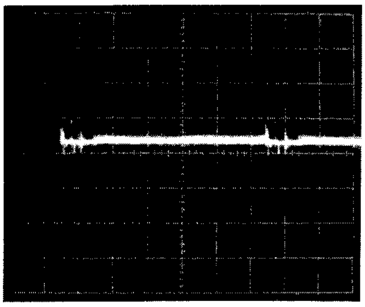


Fig. 4-8-20

- Set the lens iris to F4 and aim the camera at the gray scale.
- Adjust G GAIN VR2 so that the signal level between the blanking level and the top step of gray scale waveform is 0.65Vp-p. (Fig. 4-8-21)

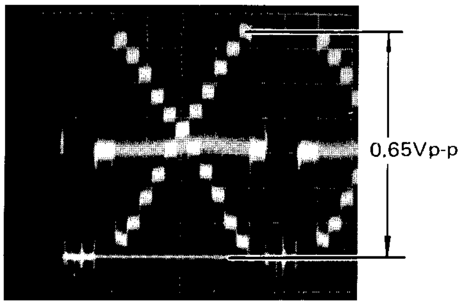


Fig. 4-8-21

(k) R gamma, pedestal and gain adjustment

Test points :	TP4 (R)	Process-2 board
	TP5 (G)	Process-2 board
Adjusts :	VR7 (R GAMMA)	Process-2 board
	VR8 (R GAIN)	Process-2 board
	VR9 (R PEDESTAL)	Process-2 board

- Aim the camera at the logarithmic gray scale chart and set the lens iris to F4.
- Connect the oscilloscope to TP4 and TP5.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Overlay the R signal and G signal on the oscilloscope and adjust R GAMMA VR7 so that the shape of R signal waveform proportionally coincides with the G signal waveform. (Fig. 4-8-22)

Note : Do not pay attention to the signal level. It will be adjusted in the next step. Overlay the signals using the variable voltage (calibration) control of oscilloscope.

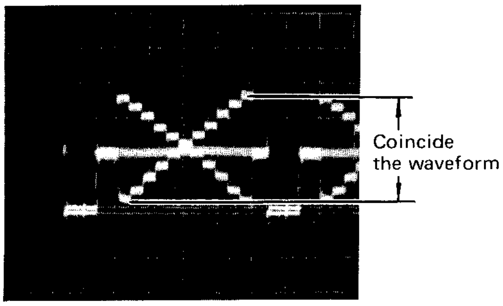
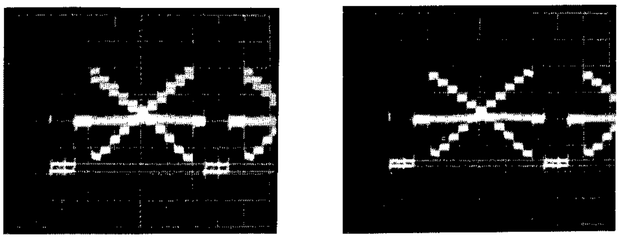


Fig. 4-8-22

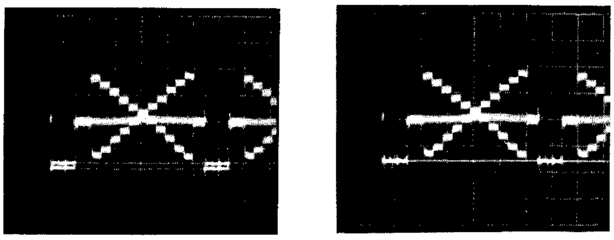
- Reset the variable voltage control of oscilloscope to the calibrating position.
- Overlay the R signal and G signal and adjust R GAIN VR8 so that the signal level between the black chip (zero step) and white chip (top step) of the gray scale waveform match. (Fig. 4-8-23)



NO GOOD GOOD

Fig. 4-8-23

- Adjust the R PEDESTAL VR9 so that the black level between the blanking level and the black chip (zero step) of the gray scale waveform match. (Fig. 4-8-24)



NO GOOD GOOD

Fig. 4-8-24

- Fine-adjust R GAMMA VR7, R GAIN VR8 and R PEDESTAL VR9 so that the R and G signal waveforms coincide each other.

(l) B gamma, pedestal and gain adjustment

Test points :	**TP6 (B)**	**Process-2 board**
	TP5 (G)	**Process-2 board**
Adjusts :	VR14 (B GAMMA)	**Process-2 board**
	VR15 (B GAIN)	**Process-2 board**
	VR16 (B PEDESTAL)	**Process-2 board**

- Aim the camera at the logarithmic gray scale chart and set the lens iris to F4.
- Connect the oscilloscope to TP5 and TP6.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Overlay the B signal and G signal on the oscilloscope and adjust B GAMMA VR14 so that the shape of B signal waveform proportionally coincides with the G signal waveform. (Fig. 4-8-25)

  Note : Do not pay attention to the signal level. It will be adjusted in the next step. Overlay the signals using the variable voltage (calibration) control of oscilloscope.

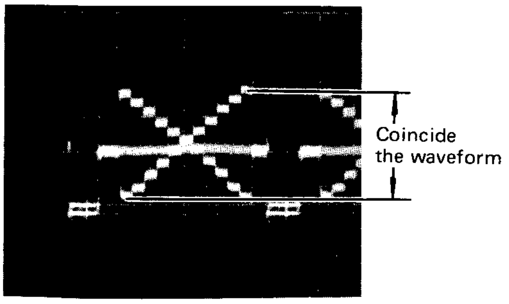


Fig. 4-8-25

- Reset the variable voltage control of oscilloscope to the calibrating position.
- Overlay the B signal and G signal and adjust B GAIN VR15 so that the signal level between the black chip (zero step) and white chip (top step) of the gray scale waveform match. (Fig. 4-8-26)

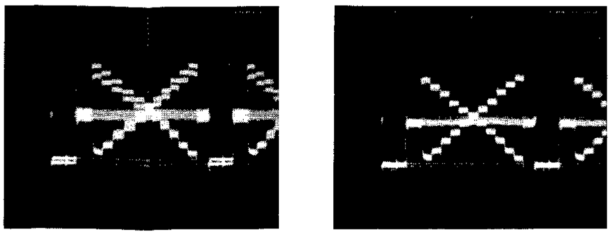

NO GOOD GOOD

Fig. 4-8-26

- Adjust the B PEDESTAL VR16 so that the black level between the blanking level and the black chip (zero step) of the gray scale waveform match. (Fig. 4-8-27)

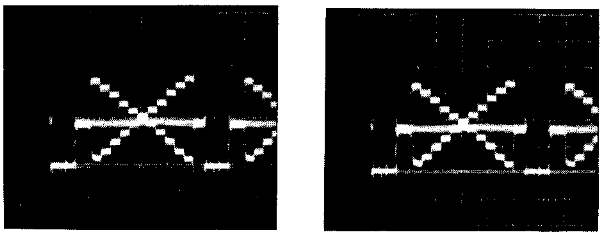

NO GOOD GOOD

Fig. 4-8-27

- Fine-adjust B GAMMA VR14, B GAIN VR15 and B PEDESTAL VR16 so that the B and G signal waveforms coincide each other.

(m) White balance fine adjustment

Test point :	VIDEO OUT	
Adjusts :	VR7 (R GAMMA)	**Process-2 board**
	VR8 (R GAIN)	**Process-2 board**
	VR9 (R PEDESTAL)	**Process-2 board**
	VR14 (B GAMMA)	**Process-2 board**
	VR15 (B GAIN)	**Process-2 board**
	VR16 (B PEDESTAL)	**Process-2 board**

- Aim the camera at the gray scale chart and set the lens iris to F4.
- Connect the oscilloscope to the terminated VIDEO OUT signal or connect the VIDEO OUT to the waveform monitor.
- Trigger the oscilloscope at H rate (Use TP 17, Mother board).

- Fine-adjust R GAMMA VR7, R GAIN VR8, R PEDESTAL VR9, B GAMMA VR14, B GAIN VR15 and B PEDESTAL VR16 so the carrier on the PAL signal is minimum. (Fig. 4-8-28)

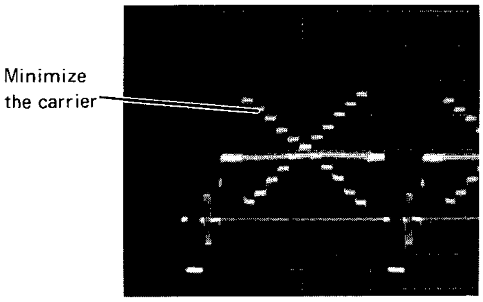


Fig. 4-8-28

(n) White clip adjustment

Test points :	TP5 PAL OUT	Process-2 board
Adjusts :	VR4 (G WHITE CLIP)	Process-2 board
	VR10 (R WHITE CLIP)	Process-2 board
	VR17 (B WHITE CLIP)	Process-2 board

- Aim the camera at the gray scale chart and set the lens iris to F2.8.
- Connect the oscilloscope to TP5.
- Trigger the oscilloscope at H rate (Use TP17, Mother board).
- Adjust G WHITE CLIP VR4 so that the G signal is clipped at 0.75Vp-p. (Fig. 4-8-29)

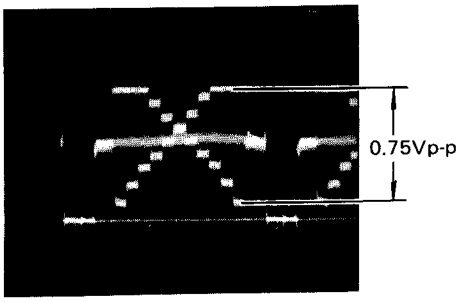
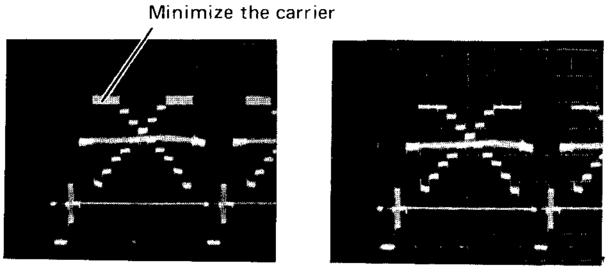


Fig. 4-8-29

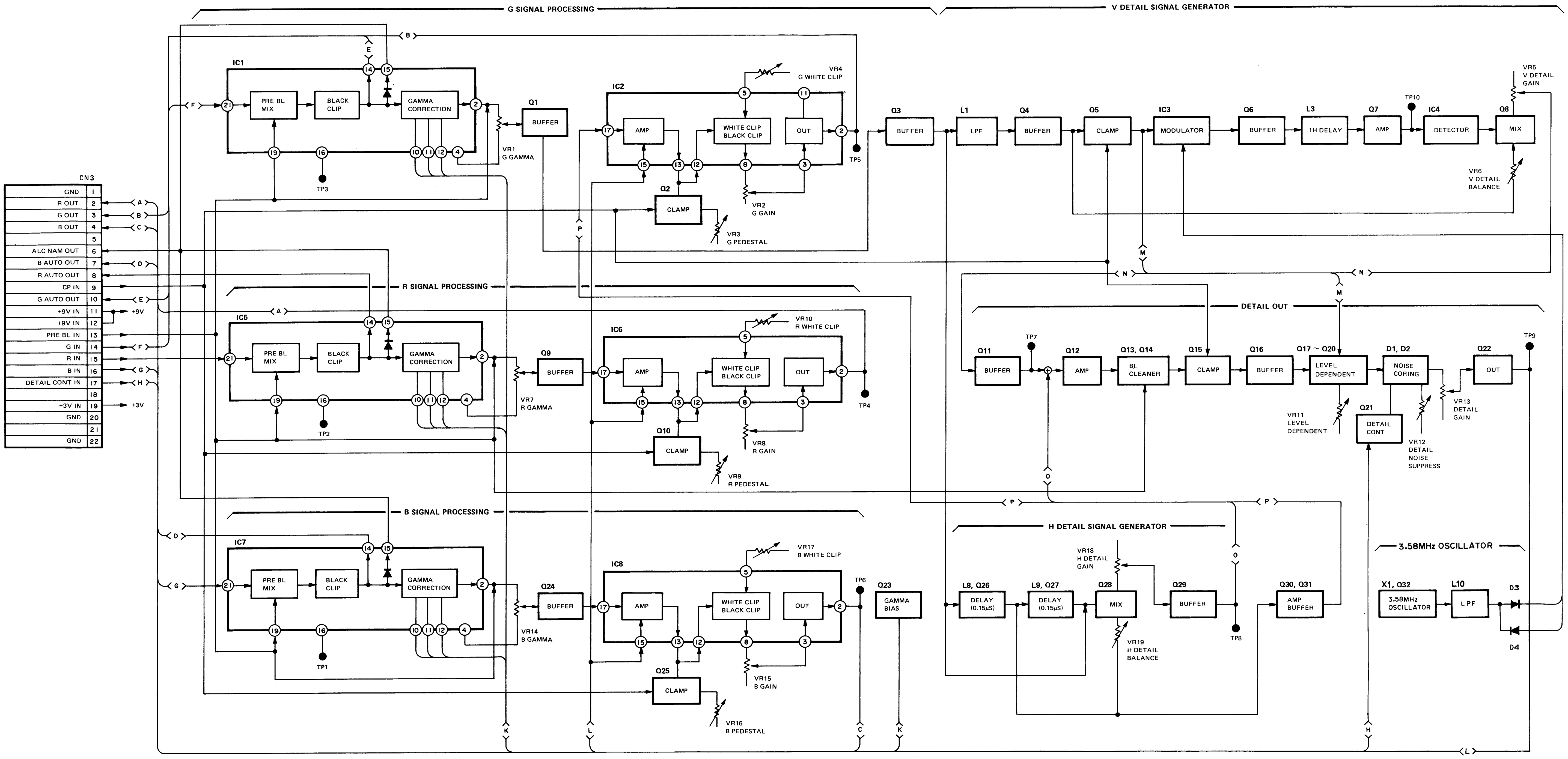
- Connect the oscilloscope to the terminated VIDEO OUT signal or connect the VIDEO OUT to the waveform monitor.
- Adjust R WHITE CLIP VR10 and B WHITE CLIP VR17 so that the carrier on the clip portion of the gray scale waveform is minimum. (Fig. 4-8-30)



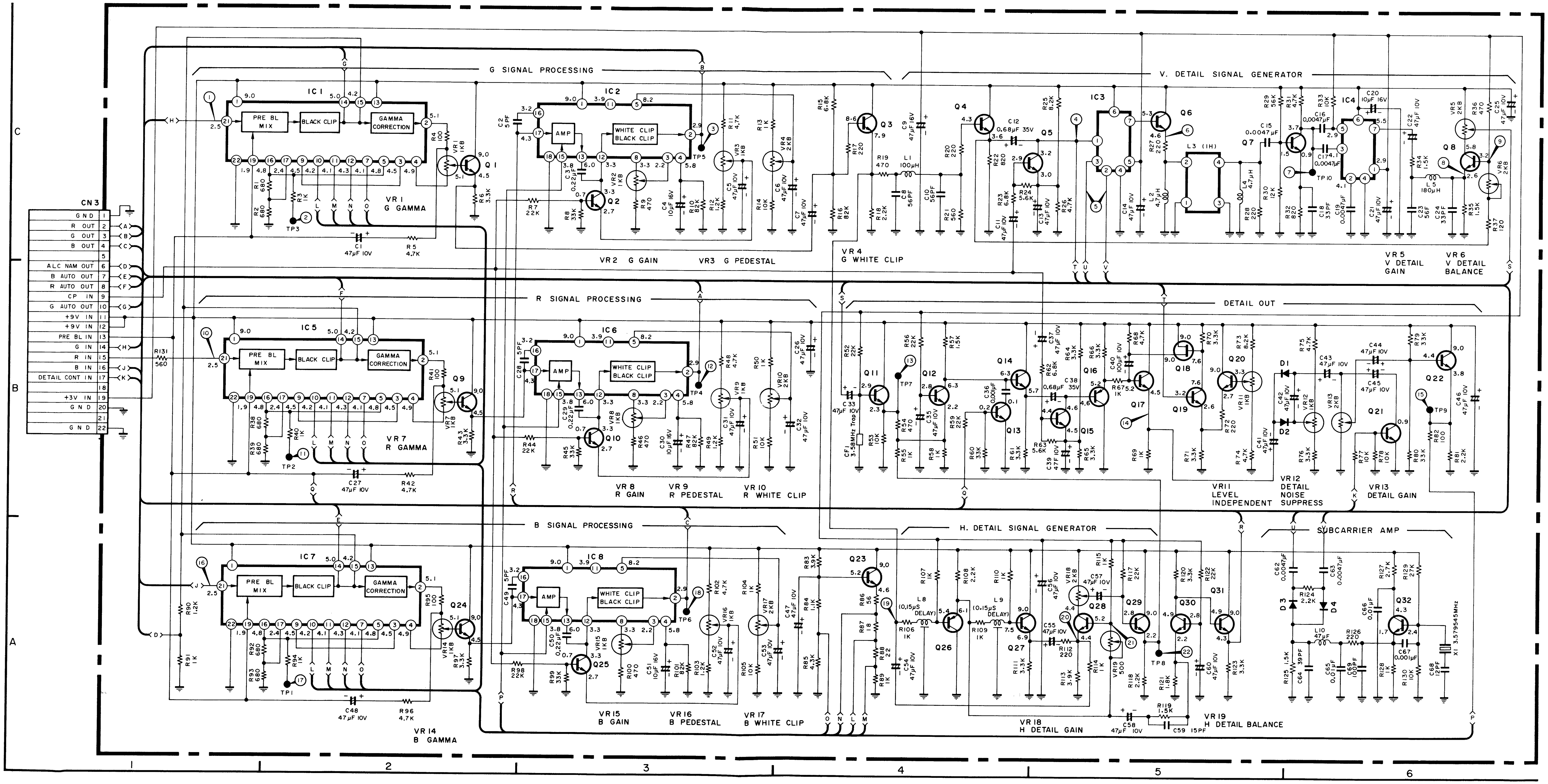
NO GOOD GOOD

Fig. 4-8-30

BLOCK DIAGRAM OF PROCESS-2 BOARD

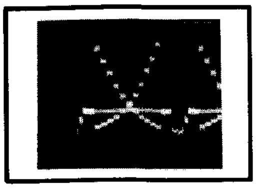

G SIGNAL PROCESSING
V DETAIL SIGNAL GENERATOR
R SIGNAL PROCESSING
B SIGNAL PROCESSING
DETAIL OUT
H DETAIL SIGNAL GENERATOR
3.58MHz OSCILLATOR
CN3
GND 1
R OUT 2
G OUT 3
B OUT 4
5
ALC NAM OUT 6
B AUTO OUT 7
R AUTO OUT 8
CP IN 9
G AUTO OUT 10
+9V IN 11
+9V IN 12
PRE BL IN 13
G IN 14
R IN 15
B IN 16
DETAIL CONT IN 17
18
+3V IN 19
GND 20
21
GND 22
+9V
+3V
IC1
IC5
IC7
PRE BL MIX
BLACK CLIP
GAMMA CORRECTION
TP3
TP2
TP1
VR1 G GAMMA
VR7 R GAMMA
VR14 B GAMMA
Q1
Q9
Q24
BUFFER
IC2
IC6
IC8
AMP
WHITE CLIP BLACK CLIP
OUT
VR4 G WHITE CLIP
VR10 R WHITE CLIP
VR17 B WHITE CLIP
VR2 G GAIN
VR8 R GAIN
VR15 B GAIN
Q2
Q10
Q25
CLAMP
VR3 G PEDESTAL
VR9 R PEDESTAL
VR16 B PEDESTAL
TP5
TP4
TP6
Q23
GAMMA BIAS
Q3
L1
LPF
Q4
Q5
IC3
MODULATOR
Q6
L3
1H DELAY
Q7
TP10
IC4
DETECTOR
Q8
MIX
VR5 V DETAIL GAIN
VR6 V DETAIL BALANCE
Q11
TP7
Q12
Q13, Q14
BL CLEANER
Q15
Q16
Q17 ~ Q20
LEVEL DEPENDENT
D1, D2
NOISE CORING
Q22
TP9
VR11 LEVEL DEPENDENT
Q21
DETAIL CONT
VR12 DETAIL NOISE SUPPRESS
VR13 DETAIL GAIN
L8, Q26
DELAY (0.15μS)
L9, Q27
Q28
VR18 H DETAIL GAIN
VR19 H DETAIL BALANCE
Q29
TP8
Q30, Q31
AMP BUFFER
X1, Q32
3.58MHz OSCILLATOR
L10
D3
D4
A
B
C
D
E
F
G
H
K
L
M
N
O
P

SCHEMATIC DIAGRAM OF PROCESS-2 BOARD

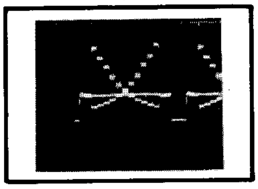

G SIGNAL PROCESSING
R SIGNAL PROCESSING
B SIGNAL PROCESSING
V. DETAIL SIGNAL GENERATOR
DETAIL OUT
H. DETAIL SIGNAL GENERATOR
SUBCARRIER AMP
CN3
GND
R OUT
G OUT
B OUT
ALC NAM OUT
B AUTO OUT
R AUTO OUT
CP IN
G AUTO OUT
+9V IN
+9V IN
PRE BL IN
G IN
R IN
B IN
DETAIL CONT IN
+3V IN
GND
GND
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
PRE BL MIX
BLACK CLIP
GAMMA CORRECTION
AMP
WHITE CLIP BLACK CLIP
VR1 G GAMMA
VR2 G GAIN
VR3 G PEDESTAL
VR4 G WHITE CLIP
VR5 V DETAIL GAIN
VR6 V DETAIL BALANCE
VR7 R GAMMA
VR8 R GAIN
VR9 R PEDESTAL
VR10 R WHITE CLIP
VR11 LEVEL INDEPENDENT
VR12 DETAIL NOISE SUPPRESS
VR13 DETAIL GAIN
VR14 B GAMMA
VR15 B GAIN
VR16 B PEDESTAL
VR17 B WHITE CLIP
VR18 H DETAIL GAIN
VR19 H DETAIL BALANCE
L3 (1H)
L8 (0.15μS DELAY)
L9 (0.15μS DELAY)
CF1 3.58MHz Trap
X1 3.579545MHz
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
TP10
A
B
C
1
2
3
4
5
6

SIGNAL WAVEFORMS OF PROCESS-2 BOARD

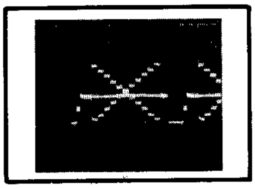
1 0.2V/DIV, 10μs/DIV



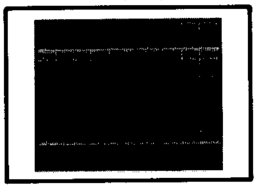
2 0.5V/DIV, 10μs/DIV



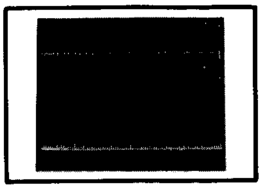
3 0.2V/DIV, 10μs/DIV



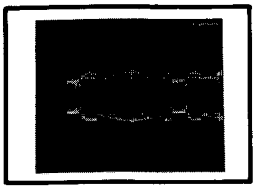
4 0.1V/DIV, 10μs/DIV



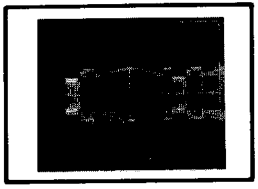
5 0.1V/DIV, 10μs/DIV



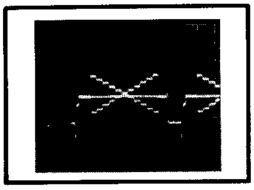
6 1V/DIV, 10μs/DIV



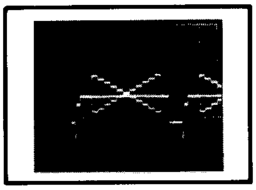
7 50mV/DIV, 10μs/DIV



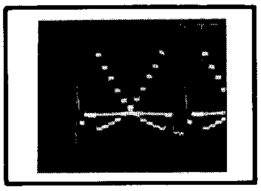
8 20mV/DIV, 10μs/DIV



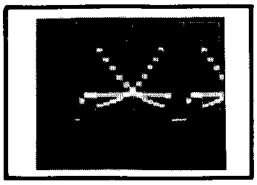
9 20mV/DIV, 10μs/DIV



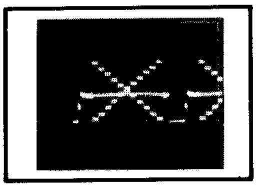
10 0.2V/DIV, 10μs/DIV



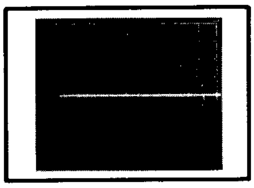
11 0.5V/DIV, 10μs/DIV



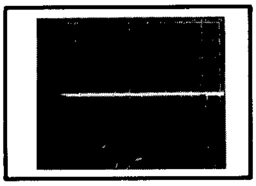
12 0.2V/DIV, 10μs/DIV



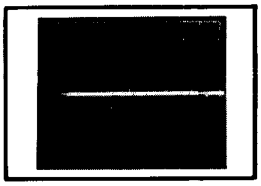
13 0.1V/DIV, 10μs/DIV



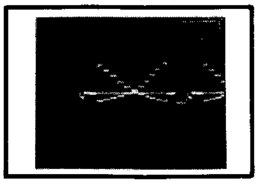
14 0.2V/DIV, 10μs/DIV



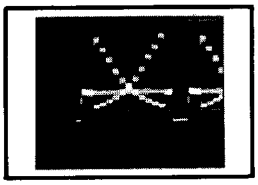
15 0.2V/DIV, 10μs/DIV



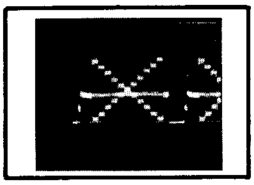
16 0.2V/DIV, 10μs/DIV



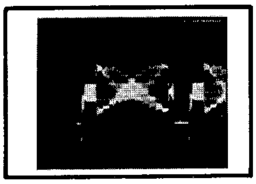
17 0.2V/DIV, 10μs/DIV



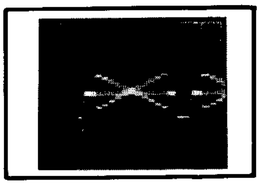
18 0.2V/DIV, 10μs/DIV



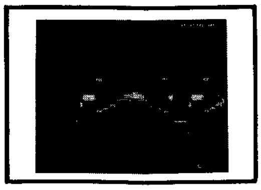
19 0.2V/DIV, 10μs/DIV



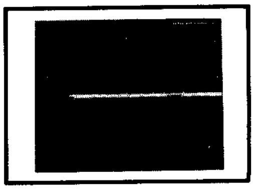
20 50mV/DIV, 10μs/DIV



21 50mV/DIV, 10μs/DIV

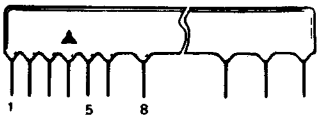


22 0.2V/DIV, 10μs/DIV

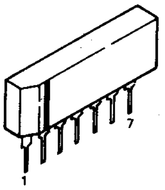


IC1	EHMS935W73S	C2
IC2	EHMS831W74SA	C3
IC3	AN614	C5
IC4	AN614	C6
IC5	EHMS935W73S	B2
IC6	EHMS831W74SA	B3
IC7	EHMS935W73S	A2
IC8	EHMS831W74SA	A3
Q1	2SD636-RS	C2
Q2	2SC641K-C	C3
Q3	2SD636-RS	C4
Q4	2SD636-RS	C4
Q5	2SC641K-C	C5
Q6	2SD636-RS	C5
Q7	2SD636-RS	C6
Q8	2SD636-RS	C6
Q9	2SD636-RS	B2
Q10	2SC641K-C	B3
Q11	2SD636-RS	B4
Q12	2SD636-RS	B4
Q13	2SC641K-C	B4
Q14	2SD636-RS	B4
Q15	2SC641K-C	B5
Q16	2SB641-RS	B5
Q17	2SD636-RS	B5
Q18	2SK34-CD	B5
Q19	2SD636-RS	B5
Q20	2SD636-RS	B5
Q21	2SD636-RS	B6
Q22	2SD636-RS	B6
Q23	2SD636-RS	A2
Q24	2SD636-RS	A3
Q25	2SC641K-C	A4
Q26	2SB641-RS	A4
Q27	2SD636-RS	A4, 5
Q28	2SD636-RS	A5
Q29	2SD636-RS	A5
Q30	2SD636-RS	A5
Q31	2SD636-RS	A5
Q32	2SD636-RS	A6
D1	IS1925	B5, 6
D2	IS1925	B5, 6
D3	OA90	A6
D4	OA90	A6

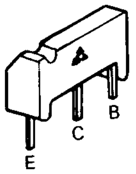
EHMS831W74SA
EHMS935W73S



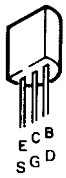
AN614



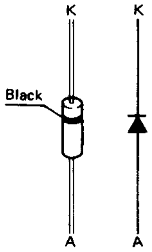
2SB641-QRS
2SD636-RS



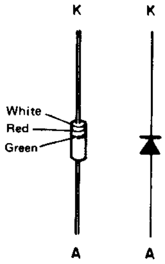
2SK34-CD
2SC641K-C



OA90



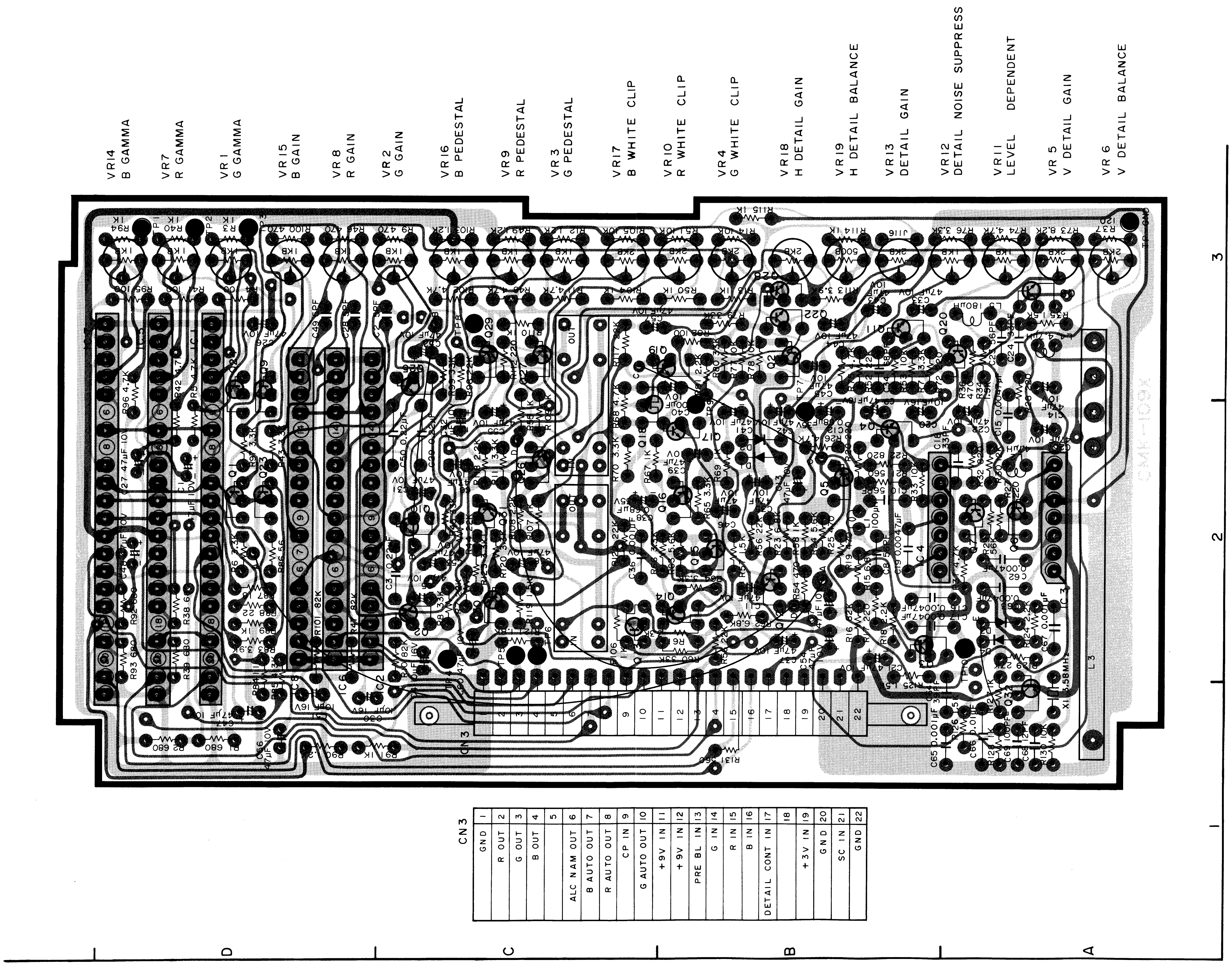
IS1925



IC1	EHMS935W73S	D2
IC2	EHMS831W74SA	D2
IC3	AN614	A2
IC4	AN614	A2
IC5	EHMS935W73S	D2
IC6	EHMS831W74SA	D2
IC7	EHMS935W73S	D2
IC8	EHMS831W74SA	D2
Q1	2SD636-RS	D2
Q2	2SC641K-C	C2
Q3	2SD636-RS	B2
Q4	2SD636-RS	B2
Q5	2SC641K-C	B2
Q6	2SD636-RS	A2
Q7	2SD636-RS	A2
Q8	2SD636-RS	A3
Q9	2SD636-RS	D3
Q10	2SC641K-C	C2
Q11	2SD636-RS	B3
Q12	2SD636-RS	B2
Q13	2SC641K-C	C2
Q14	2SD636-RS	B2
Q15	2SC641K-C	B2
Q16	2SB641-RS	B2
Q17	2SD636-RS	B2
Q18	2SK34-CD	C2
Q19	2SD636-RS	B3
Q20	2SD636-RS	A3

Q21	2SD636-RS	B3
Q22	2SD636-RS	B3
Q23	2SD636-RS	D2
Q24	2SD636-RS	D3
Q25	2SC641K-C	C3
Q26	2SB641-RS	C2
Q27	2SD636-RS	
Q28	2SD636-RS	B3
Q29	2SD636-RS	C3
Q30	2SD636-RS	C2
Q31	2SD636-RS	C2
Q32	2SD636-RS	A1
D1	IS1925	B2
D2	IS1925	B2
D3	OA90	A2
D4	OA90	A2

CONDUCTOR VIEW OF PROCESS-2 BOARD


VR14 B GAMMA
VR7 R GAMMA
VR1 G GAMMA
VR15 B GAIN
VR8 R GAIN
VR2 G GAIN
VR16 B PEDESTAL
VR9 R PEDESTAL
VR3 G PEDESTAL
VR17 B WHITE CLIP
VR10 R WHITE CLIP
VR4 G WHITE CLIP
VR18 H DETAIL GAIN
VR19 H DETAIL BALANCE
VR13 DETAIL GAIN
VR12 DETAIL NOISE SUPPRESS
VR11 LEVEL DEPENDENT
VR5 V DETAIL GAIN
VR6 V DETAIL BALANCE
CN3
CMK-109X
3
2
1
D
C
B
A

CN3	
1	GND
2	R OUT
3	G OUT
4	B OUT
5	
6	ALC NAM OUT
7	B AUTO OUT
8	R AUTO OUT
9	CP IN
10	G AUTO OUT
11	+9V IN
12	+9V IN
13	PRE BL IN
14	G IN
15	R IN
16	B IN
17	DETAIL CONT IN
18	
19	+3V IN
20	GND
21	SC IN
22	GND

REPLACEMENT PARTS LIST

Important Notice

Component identified by * mark are new parts used from this model.

SYMBOL NO.	PART NO.	DESCRIPTION	
YFVPKP777F7A PROCESS-2 BOARD			
PCB002	*YFVPKP777F7A	Printed Circuit Board Assembly	
IC1	EHMS935W73S	IC	
IC2	EHMS831W74SA	IC	
IC3,4	AN614	IC	
IC5	EHMS935W73S	IC	
IC6	EHMS831W74SA	IC	
IC7	EHMS935W73S	IC	
IC8	EHMS831W74SA	IC	
Q1	2SD636-RS	Transistor	
Q2	2SC641K-C	Transistor	
Q3,4	2SD636-RS	Transistor	
Q5	2SC641K-C	Transistor	
Q6-9	2SD636-RS	Transistor	
Q10	2SC641K-C	Transistor	
Q11,12	2SD636-RS	Transistor	
Q13	2SC641K-C	Transistor	
Q14	2SD636-RS	Transistor	
Q15	2SC641K-C	Transistor	
Q16	2SB641-RS	Transistor	
Q17	2SD636-RS	Transistor	
Q18	2SK34-CD	Transistor	
Q19-24	2SD636-RS	Transistor	
Q25	2SC641K-C	Transistor	
Q26	2SB641-RS	Transistor	
Q27-32	2SD636-RS	Transistor	
D1,2	1S1925	Diode	
D3,4	0A90	Diode	
R1,2	ER010CKF6800	Metal	680 ohms 1/8W
R3	ERD10TJ102	Carbon	1K ohms 1/8W
R4	ERD10TJ101	Carbon	100 ohms 1/8W
R5	ERD10TJ472	Carbon	4.7K ohms 1/8W
R6	ERD10TJ332	Carbon	3.3K ohms 1/8W
R7	ERD10TJ223	Carbon	22K ohms 1/8W
R8	ERD10TJ333	Carbon	33K ohms 1/8W
R9	ERD10TJ471	Carbon	470 ohms 1/8W
R10	ERD10TJ823	Carbon	82K ohms 1/8W
R11	ERD10TJ472	Carbon	4.7K ohms 1/8W
R12	ERD10TJ122	Carbon	1.2K ohms 1/8W
R13	ERD10TJ102	Carbon	1K ohms 1/8W
R14	ERD10TJ103	Carbon	10K ohms 1/8W
R15	ERD10TJ682	Carbon	6.8K ohms 1/8W
R16	ERD10TJ823	Carbon	82K ohms 1/8W
R17	ERD10TJ221	Carbon	220 ohms 1/8W
R18	ERD10TJ222	Carbon	2.2K ohms 1/8W
R19	ERD10TJ471	Carbon	470 ohms 1/8W

SYMBOL NO.	PART NO.	DESCRIPTION	
R20	ERD10TJ221	Carbon	220 ohms 1/8W
R21	ERD10TJ561	Carbon	560 ohms 1/8W
R22	ERD10TJ821	Carbon	820 ohms 1/8W
R23	ERD10TJ682	Carbon	6.8K ohms 1/8W
R24	ERD10TJ562	Carbon	5.6K ohms 1/8W
R25	ERD10TJ822	Carbon	8.2K ohms 1/8W
R26	ERD10TJ472	Carbon	4.7K ohms 1/8W
R27,28	ERD10TJ221	Carbon	220 ohms 1/8W
R29	ERD10TJ563	Carbon	56K ohms 1/8W
R30	ERD10TJ123	Carbon	12K ohms 1/8W
R31	ERD10TJ472	Carbon	4.7K ohms 1/8W
R32	ERD10TJ821	Carbon	820 ohms 1/8W
R33	ERD10TJ103	Carbon	10K ohms 1/8W
R34,35	ERD10TJ152	Carbon	1.5K ohms 1/8W
R36	ERD10TJ471	Carbon	470 ohms 1/8W
R37	ERD10TJ121	Carbon	120 ohms 1/8W
R38,39	ER010CKF6800	Metal	680 ohms 1/8W
R40	ERD10TJ102	Carbon	1K ohms 1/8W
R41	ERD10TJ101	Carbon	100 ohms 1/8W
R42	ERD10TJ472	Carbon	4.7K ohms 1/8W
R43	ERD10TJ332	Carbon	3.3K ohms 1/8W
R44	ERD10TJ223	Carbon	22K ohms 1/8W
R45	ERD10TJ333	Carbon	33K ohms 1/8W
R46	ERD10TJ471	Carbon	470 ohms 1/8W
R47	ERD10TJ823	Carbon	82K ohms 1/8W
R48	ERD10TJ472	Carbon	4.7K ohms 1/8W
R49	ERD10TJ122	Carbon	1.2K ohms 1/8W
R50	ERD10TJ102	Carbon	1K ohms 1/8W
R51	ERD10TJ103	Carbon	10K ohms 1/8W
R52	ERD10TJ223	Carbon	22K ohms 1/8W
R53	ERD10TJ103	Carbon	10K ohms 1/8W
R54	ERD10TJ471	Carbon	470 ohms 1/8W
R55	ERD10TJ102	Carbon	1K ohms 1/8W
R56	ERD10TJ223	Carbon	22K ohms 1/8W
R57	ERD10TJ152	Carbon	1.5K ohms 1/8W
R58	ERD10TJ102	Carbon	1K ohms 1/8W
R59	ERD10TJ223	Carbon	22K ohms 1/8W
R60	ERD10TJ333	Carbon	33K ohms 1/8W
R61	ERD10TJ332	Carbon	3.3K ohms 1/8W
R62	ERD10TJ682	Carbon	6.8K ohms 1/8W
R63	ERD10TJ562	Carbon	5.6K ohms 1/8W
R64-66	ERD10TJ332	Carbon	3.3K ohms 1/8W
R67	ERD10TJ102	Carbon	1K ohms 1/8W
R68	ERD10TJ472	Carbon	4.7K ohms 1/8W
R69	ERD10TJ102	Carbon	1K ohms 1/8W
R70,71	ERD10TJ332	Carbon	3.3K ohms 1/8W
R72	ERD10TJ221	Carbon	220 ohms 1/8W
R73	ERD10TJ822	Carbon	8.2K ohms 1/8W

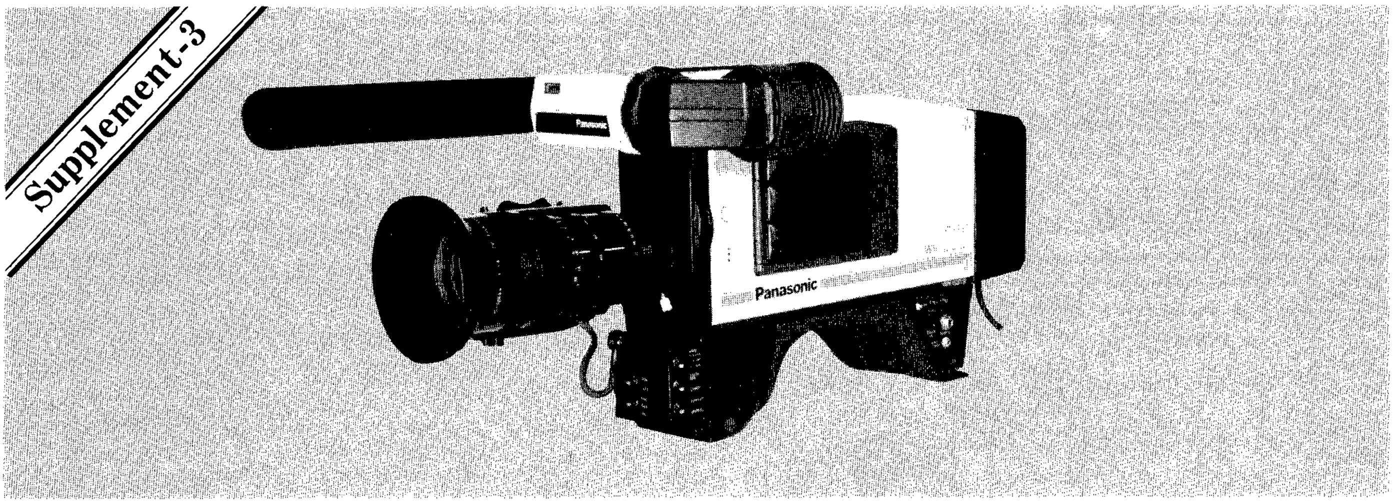
SYMBOL NO.	PART NO.	DESCRIPTION	
R74,75	ERD10TJ472	Carbon	4.7K ohms 1/8W
R76	ERD10TJ332	Carbon	3.3K ohms 1/8W
R77,78	ERD10TJ103	Carbon	10K ohms 1/8W
R79,80	ERD10TJ333	Carbon	33K ohms 1/8W
R81	ERD10TJ222	Carbon	2.2K ohms 1/8W
R82	ERD10TJ101	Carbon	100 ohms 1/8W
R83	ER010CKF3901	Metal	3.9K ohms 1/8W
R84	ER010CKF1101	Metal	1.1K ohms 1/8W
R85	ER010CKF4301	Metal	4.3K ohms 1/8W
R86	ER010CKF56R0	Metal	56 ohms 1/8W
R87	ER010CKF18R0	Metal	18 ohms 1/8W
R88	ER010CKF22R0	Metal	22 ohms 1/8W
R89	ER010CKF1001	Metal	1K ohms 1/8W
R90	ERD10TJ122	Carbon	1.2K ohms 1/8W
R91	ERD10TJ102	Carbon	1K ohms 1/8W
R92,93	ER010CKF6800	Metal	680 ohms 1/8W
R94	ERD10TJ102	Carbon	1K ohms 1/8W
R95	ERD10TJ101	Carbon	100 ohms 1/8W
R96	ERD10TJ472	Carbon	4.7K ohms 1/8W
R97	ERD10TJ332	Carbon	3.3K ohms 1/8W
R98	ERD10TJ223	Carbon	22K ohms 1/8W
R99	ERD10TJ333	Carbon	33K ohms 1/8W
R100	ERD10TJ471	Carbon	470 ohms 1/8W
R101	ERD10TJ823	Carbon	82K ohms 1/8W
R102	ERD10TJ472	Carbon	4.7K ohms 1/8W
R103	ERD10TJ122	Carbon	1.2K ohms 1/8W
R104	ERD10TJ102	Carbon	1K ohms 1/8W
R105	ERD10TJ103	Carbon	10K ohms 1/8W
R106,107	ERD10TJ102	Carbon	1K ohms 1/8W
R108	ERD10TJ222	Carbon	2.2K ohms 1/8W
R109,110	ERD10TJ102	Carbon	1K ohms 1/8W
R111	ERD10TJ332	Carbon	3.3K ohms 1/8W
R112	ERD10TJ221	Carbon	220 ohms 1/8W
R113	ERD10TJ392	Carbon	3.9K ohms 1/8W
R114,115	ERD10TJ102	Carbon	1K ohms 1/8W
R117	ERD10TJ223	Carbon	22K ohms 1/8W
R118	ERD10TJ222	Carbon	2.2K ohms 1/8W
R119	ERD10TJ152	Carbon	1.5K ohms 1/8W
R120	ERD10TJ332	Carbon	3.3K ohms 1/8W
R121	ERD10TJ182	Carbon	1.8K ohms 1/8W
R122	ERD10TJ223	Carbon	22K ohms 1/8W
R123	ERD10TJ332	Carbon	3.3K ohms 1/8W
R124	ERD10TJ222	Carbon	2.2K ohms 1/8W
R125,126	ERD10TJ152	Carbon	1.5K ohms 1/8W
R127,128	ERD10TJ102	Carbon	1K ohms 1/8W
R129	ERD10TJ273	Carbon	27K ohms 1/8W
R130	ERD10TJ103	Carbon	10K ohms 1/8W
R131	ERD10TJ561	Carbon	560 ohms 1/8W
VR1-3	YFN6M9S1K	Variable Resistor	1K ohms
VR4-6	YFN6M9S2K	Variable Resistor	2K ohms
VR7-9	YFN6M9S1K	Variable Resistor	1K ohms
VR10	YFN6M9S2K	Variable Resistor	2K ohms

SYMBOL NO.	PART NO.	DESCRIPTION	
VR11,12	YFN6M9S1K	Variable Resistor	1K ohms
VR13	YFN6M9S2K	Variable Resistor	2K ohms
VR14-16	YFN6M9S1K	Variable Resistor	1K ohms
VR17,18	YFN6M9S2K	Variable Resistor	2K ohms
VR19	YFN6M9S500	Variable Resistor	500 ohms
C1	ECEA1AS470	Electrolytic	47 µF 10V
C2	ECCF1H050DC	Ceramic	5 pF 50V
C3	ECQV05224JZ	Plastic	0.22 µF 50V
C4	ECEA1CS100	Electrolytic	10 µF 16V
C5-7	ECEA1AS470	Electrolytic	47 µF 10V
C8	ECCF1H560JC	Ceramic	56 pF 50V
C9	ECEA1AS470	Electrolytic	47 µF 10V
C10	ECCF1H560JC	Ceramic	56 pF 50V
C11	ECEA1AS470	Electrolytic	47 µF 10V
C12	ECSF35ER68	Electrolytic	0.68 µF 35V
C13,14	ECEA1AS470	Electrolytic	47 µF 10V
C15-17	ECQP1472JZ	Plastic	4700 pF 100V
C18	ECCF1H330JC	Ceramic	33 pF 50V
C19	ECQP1472JZ	Plastic	4700 pF 100V
C20	ECEA1CS100	Electrolytic	10 µF 16V
C21,22	ECEA1AS470	Electrolytic	47 µF 10V
C23	ECCF1H560JC	Ceramic	56 pF 50V
C24	ECCF1H330JC	Ceramic	33 pF 50V
C25-27	ECEA1AS470	Electrolytic	47 µF 10V
C28	ECCF1H050DC	Ceramic	5 pF 50V
C29	ECQV05224JZ	Plastic	0.22 µF 50V
C30	ECEA1CS100	Electrolytic	10 µF 16V
C31-33	ECEA1AS470	Electrolytic	47 µF 10V
C35	ECEA1AS470	Electrolytic	47 µF 10V
C36	ECQP1102JZ	Plastic	1000 pF 100V
C37	ECEA1AS470	Electrolytic	47 µF 10V
C38	ECSF35ER68	Electrolytic	0.68 µF 35V
C39	ECEA1AS470	Electrolytic	47 µF 10V
C40	ECEA1AS101	Electrolytic	100 µF 10V
C41-48	ECEA1AS470	Electrolytic	47 µF 10V
C49	ECCF1H050DC	Ceramic	5 pF 50V
C50	ECQV05224JZ	Plastic	0.22 µF 50V
C51	ECEA1CS100	Electrolytic	10 µF 16V
C52-58	ECEA1AS470	Electrolytic	47 µF 10V
C59	ECCF1H150JC	Ceramic	15 pF 50V
C60	ECEA1AS470	Electrolytic	47 µF 10V
C62,63	ECQP1472JZ	Plastic	4700 pF 100V
C64,65	ECCF1H390JC	Ceramic	39 pF 50V
C66	ECQP1103JZ	Plastic	0.01 µF 100V
C67	ECQP1102JZ	Plastic	1000 pF 100V
C68	ECCF1H120JC	Ceramic	12 pF 50V
C69	ECCF1H101JC	Ceramic	100 pF 50V
L1	YWL5101J	Coil	100 µH
L2	YFL54R7J	Coil	4.7 µH
L3	EFDMN645D69F	Delay Line	
L4	YFL54R7J	Coil	4.7 µH
L5	YFLS7181J	Coil	180 µH
L8,9	*YFDL102A1506	Delay Line	
L10	YFL5470J	Coil	47 µH
X1	*YFKD0930DL	Crystal Oscillator	
CF1	EFCA3R58MB3	Ceramic Filter	3.58MHz TRAP
J116	ERD25TC0	Jumper Resistor	
CN1	YFPCN622PADS	Connector	
M657	*YFV2HA0101A4	Shield	

ORDER NO. VKD83050759S8

Service Manual

Colour Video Camera
WV-777 Series



- Please file this supplement service manual with the service manual Order No. VKD82100662C8.

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Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

LIST OF MODIFICATION

ENCODER BOARD (YFVPKP777F2A)

- Resistor R54 has been changed for enlargement of the variable range of chroma gain.
- Capacitor C54 has been added to lower the rising time of sync signal for prevention of overshoot.

SYNC-1 BOARD (YFVPKP777F3A)

- Resistor R15 has been changed to improve the sync separation of time lag for prevention of jitter.

DEFLECTION BOARD (YFVPKP777F6A)

- Resistor, R76, R109, R116 and R123 have been changed to make the variable range to one half for centering adjustment.
- Capacitor C51 has been changed to conform the vertical linear correction parabora waveform and the vertical deflection current waveform.

MOTHER BOARD (YFVPKB0777FA)

- Resistor, R58, R118, R119 and capacitor C40 have been changed to decrease the chroma sigual crosstalk with luminence signal at Y out and C out mode.
- Resistor R69 has been changed to increase the intercom current for head set to enlarge the audio level.
- Resistor, R111 and R119 has been changed to spread the dynamic range of VTR output circuit.
- Capacitor C36 has been changed to remove the noise of power source.

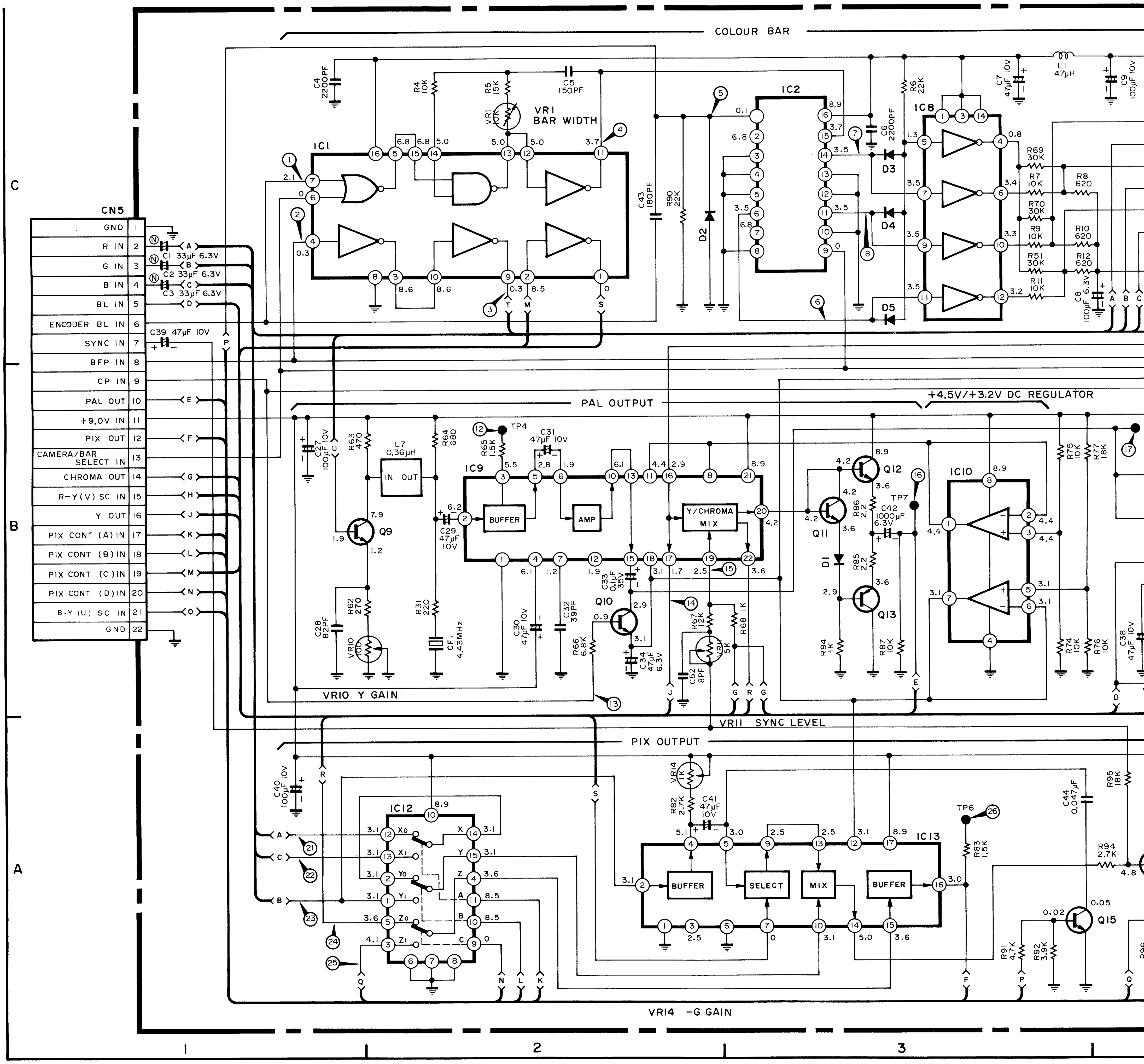
REMOTE CONTROL UNIT (RCU) WV-RC30

- Trimmer capacitor CT1 has been added to correct the colour drift for the PAL output circuit to prevention the colour drift by the length of camera cable, and also resistor, R99, R102 and R105 have been changed.

HIGH VOLTAGE BOARD (YFVPKP77712A)

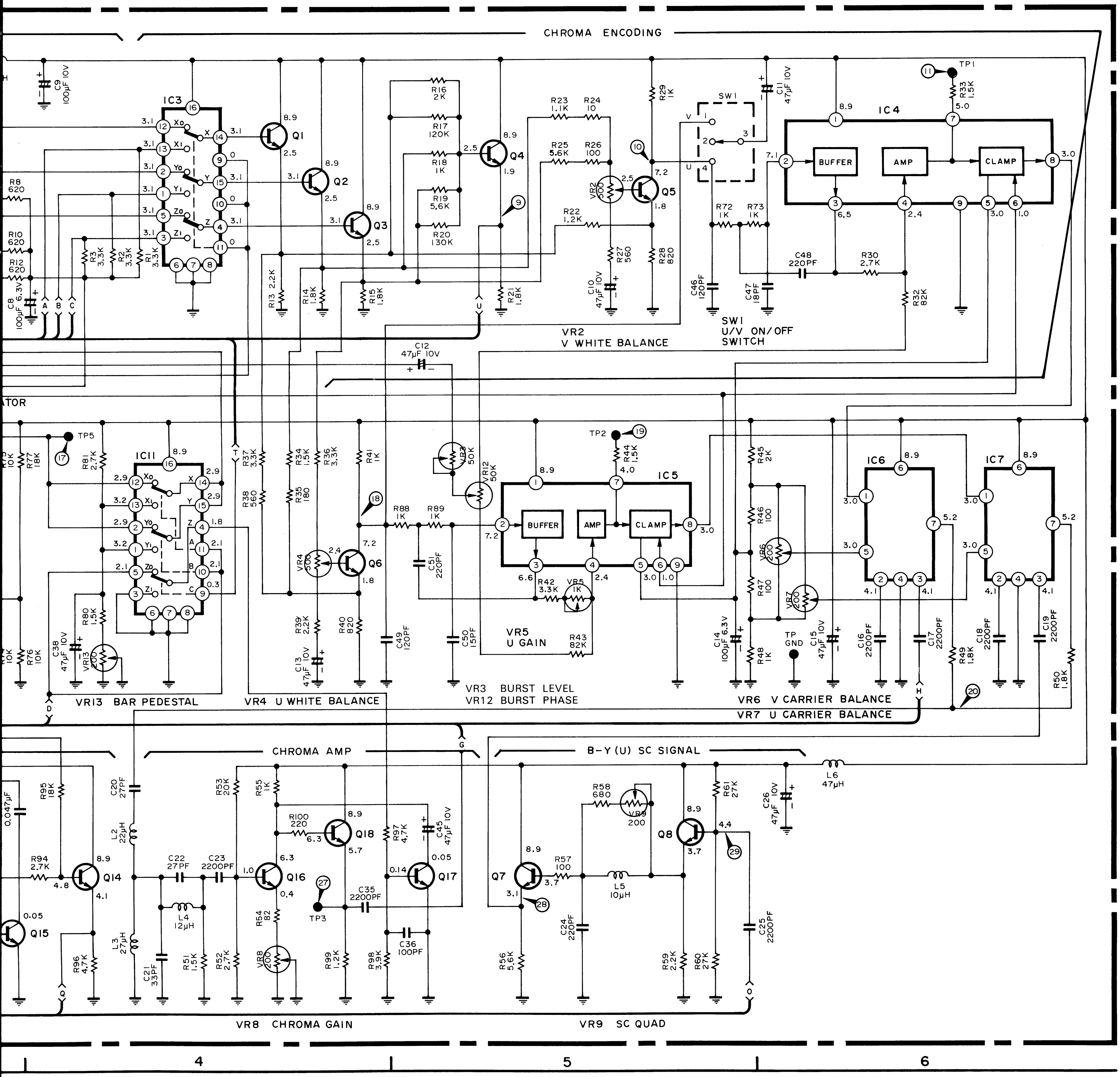
- Resistor, R13 and R14 have been changed to improve the voltage ratio between grid 5 and grid 6 for prevention of flicker.
- Resistor R29 has been changed to increase the gain of cathode blanking for leak of the video signal during the horizontal blanking perial.

SCHEMATIC DIAGRAM C


COLOUR BAR
PAL OUTPUT
+4.5V/+3.2V DC REGULATOR
PIX OUTPUT
CN5
GND 1
R IN 2
G IN 3
B IN 4
BL IN 5
ENCODER BL IN 6
SYNC IN 7
BFP IN 8
CP IN 9
PAL OUT 10
+9.0V IN 11
PIX OUT 12
CAMERA/BAR SELECT IN 13
CHROMA OUT 14
R-Y(V) SC IN 15
Y OUT 16
PIX CONT (A) IN 17
PIX CONT (B) IN 18
PIX CONT (C) IN 19
PIX CONT (D) IN 20
B-Y(U) SC IN 21
GND 22
C1 33μF 6.3V
C2 33μF 6.3V
C3 33μF 6.3V
C39 47μF 10V
IC1
IC2
IC8
IC9
IC10
IC12
IC13
C4 2200PF
R4 10K
R5 15K
VR1 10K
VR1 BAR WIDTH
C5 150PF
C43 180PF
R90 22K
D2
R6 22K
C6 2200PF
D3
D4
D5
C7 47μF 10V
L1 47μH
C9 100μF 10V
R69 30K
R7 10K
R8 620
R70 30K
R9 10K
R10 620
R51 30K
R12 620
R11 10K
C8 100μF 6.3V
C27 100μF 10V
R63 470
L7 0.36μH
IN OUT
R64 680
TP4
R65 1.5K
C31 47μF 10V
BUFFER
AMP
Y/CHROMA MIX
Q9
C29 47μF 10V
C28 82PF
R62 270
VR10 100
R31 220
CF1 4.43MHz
C30 47μF 10V
C32 39PF
C33 0.1μF 35V
Q10
R66 6.8K
C34 47μF 6.3V
R67 12K
R68 1K
VR11 5K
C52 8PF
VR10 Y GAIN
VR11 SYNC LEVEL
Q11
Q12
Q13
R86 2.2
C42 1000μF 6.3V
TP7
D1
R85 2.2
R84 1K
R87 10K
R75 10K
R77 18K
R74 10K
R76 10K
C38 47μF 10V
C40 100μF 10V
VR14 1K
R82 2.7K
C41 47μF 10V
SELECT
MIX
TP6
R83 1.5K
C44 0.047μF
R95 18K
R94 2.7K
Q15
R91 4.7K
R92 3.9K
VR14 -G GAIN
X0 X1 Y0 Y1 Z0 Z1 X Y Z A B C
1
2
3
A
B
C

IC1	HD14572UBP	C1, C2	IC8	YWMC14050BCP	C3	Q1	2SD636-RS	C4	Q8	2SD636-RS	A5
IC2	YWHD14516BP	C3	IC9	EHMS937H39S	B2	Q2	2SD636-RS	C4	Q9	2SD636-RS	B1
IC3	HD14053BP	C4	IC10	YHSNJM4558D	B3	Q3	2SD636-RS	C4	Q10	2SC641K-C	B2
IC4	EHMSJ12H37S	C6	IC11	TC4053BP	B4	Q4	2SD636-RS	C5	Q11	2SD636-RS	B3
IC5	EHMSJ12H37S	B5	IC12	HD14053BP	A2	Q5	2SD636-RS	C5	Q12	2SD638-QR	B3
IC6	AN614	B6	IC13	EHMSU27H38S	A2, A3	Q6	2SD636-RS	B4	Q13	2SB643-QR	B3
IC7	AN614	B6				Q7	2SD636-RS	A5	Q14	2SC2377-CD	A4

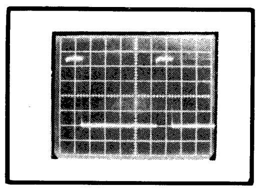
AM OF ENCODER BOARD


CHROMA ENCODING
IC3
IC4
IC5
IC6
IC7
IC11
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q14
Q15
Q16
Q17
Q18
BUFFER
AMP
CLAMP
SW1
SW1 U/V ON/OFF SWITCH
VR2 V WHITE BALANCE
VR13 BAR PEDESTAL
VR4 U WHITE BALANCE
VR5 U GAIN
VR3 BURST LEVEL
VR12 BURST PHASE
VR6 V CARRIER BALANCE
VR7 U CARRIER BALANCE
CHROMA AMP
B-Y (U) SC SIGNAL
VR8 CHROMA GAIN
VR9 SC QUAD
TP1
TP2
TP3
TP5
TP GND
L6 47μH
L5 10μH
L4 12μH
L2 22μH
L3 27μH
C9 100μF 10V
C11 47μF 10V
C12 47μF 10V
R16 2K
R17 120K
R18 1K
R19 5.6K
R20 130K
R23 1.1K
R24 10
R25 5.6K
R26 100
R22 1.2K
R27 560
R28 820
R29 1K
R33 1.5K
R72 1K
R73 1K
C48 220PF
R30 2.7K
R32 82K
C46 120PF
C47 18PF
R44 1.5K
R88 1K
R89 1K
R42 3.3K
R43 82K
C49 120PF
C50 15PF
C51 220PF
R39 2.2K
R40 820
R41 1K
R45 2K
R46 100
R47 100
R48 1K
C14 100μF 6.3V
C15 47μF 10V
C16 2200PF
C17 2200PF
C18 2200PF
C19 2200PF
R49 1.8K
R50 1.8K
R53 20K
R55 1K
R100 220
R97 4.7K
C45 47μF 10V
C22 27PF
C23 2200PF
C20 27PF
C21 33PF
R51 1.5K
R52 2.7K
R54 82
C35 2200PF
C36 100PF
R99 1.2K
R98 3.9K
R58 680
R57 100
R61 27K
C26 47μF 10V
C24 220PF
C25 2200PF
R56 5.6K
R59 2.2K
R60 27K
R94 2.7K
R95 18K
R96 4.7K
R80 1.5K
R81 2.7K
R76 10K
R77 18K
C38 47μF 10V
C13 47μF 10V
C10 47μF 10V
R13 2.2K
R14 1.8K
R15 1.8K
R21 1.8K
R34 1.5K
R35 180
R36 3.3K
R37 3.3K
R38 560
R1 3.3K
R2 3.3K
R3 3.3K
R8 620
R10 620
R12 620
C8 100μF 6.3V
TOR
4
5
6

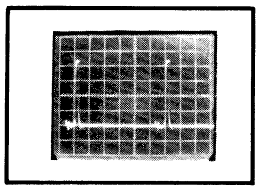
A5	Q15	2SC641K-C	A3	D1	MA165	B3
B1	Q16	2SD636-RS	A4	D2	MA165	C2
B2	Q17	2SC641K-C	A5	D3	MA165	C3
B3	Q18	2SD636-RS	A4	D4	MA165	C3
B3				D5	MA165	C3
B3						
A4						

SIGNAL WAVEFORMS OF ENCODER BOARD

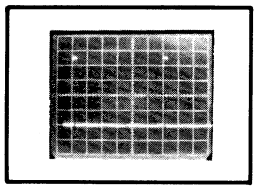
1 2V/DIV, 10μs/DIV



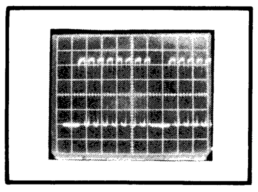
2 2V/DIV, 10μs/DIV



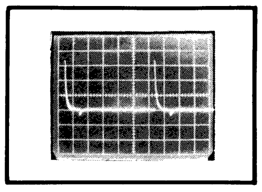
3 2V/DIV, 10μs/DIV



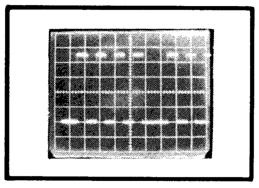
4 2V/DIV, 10μs/DIV



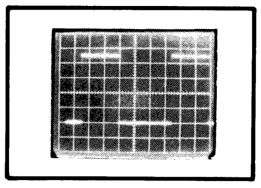
5 2V/DIV, 10μs/DIV



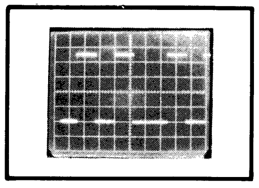
6 2V/DIV, 10μs/DIV



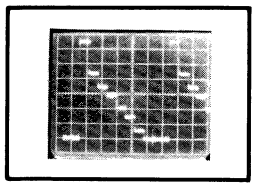
7 2V/DIV, 10μs/DIV



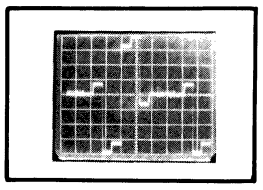
8 2V/DIV, 10μs/DIV



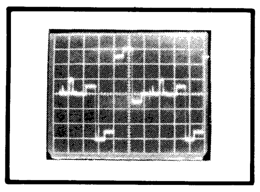
9 0.1V/DIV, 10μs/DIV



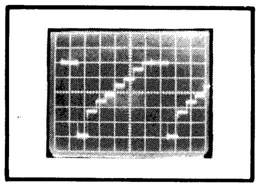
10 0.1V/DIV, 10μs/DIV



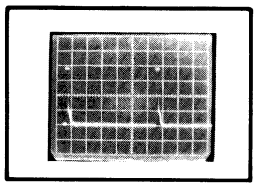
11 0.1V/DIV, 10μs/DIV



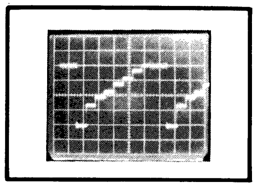
12 0.1V/DIV, 10μs/DIV



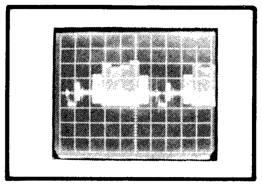
13 2V/DIV, 10μs/DIV



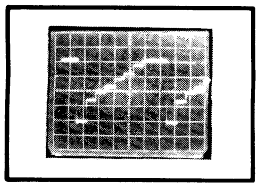
14 0.2V/DIV, 10μs/DIV



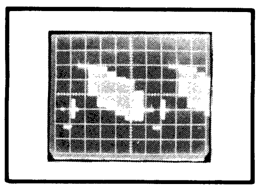
15 20mV/DIV, 10μs/DIV



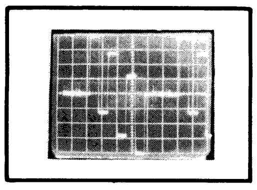
16 0.2V/DIV, 10μs/DIV



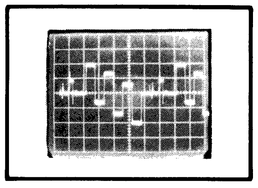
17 0.5V/DIV, 10μs/DIV



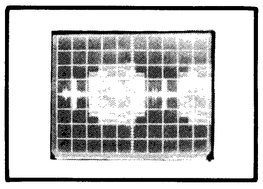
18 0.1V/DIV, 10μs/DIV



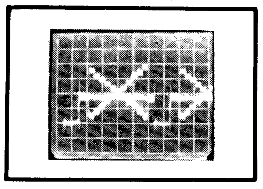
19 0.1V/DIV, 10μs/DIV



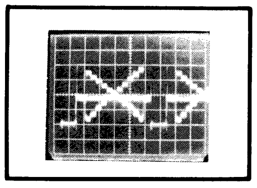
20 0.1V/DIV, 10μs/DIV



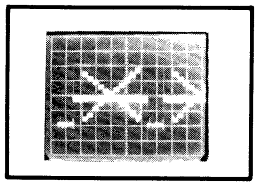
21 0.2V/DIV, 10μs/DIV



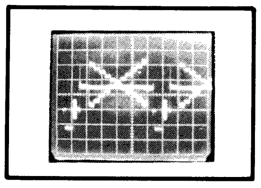
22 0.2V/DIV, 10μs/DIV



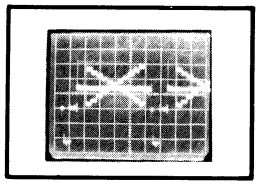
23 0.2V/DIV, 10μs/DIV



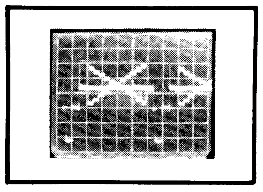
24 0.5V/DIV, 10μs/DIV



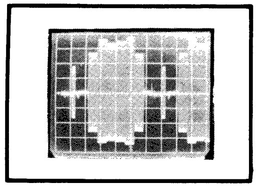
25 0.5V/DIV, 10μs/DIV



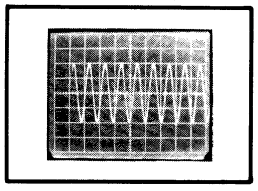
26 0.5V/DIV, 10μs/DIV



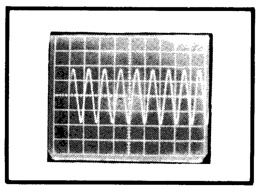
27 0.2V/DIV, 10μs/DIV



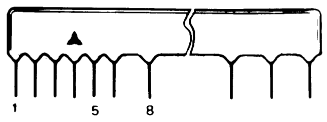
28 0.1V/DIV, 0.2μs/DIV



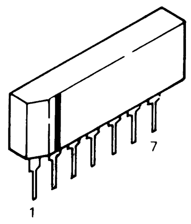
29 0.1V/DIV, 0.2μs/DIV



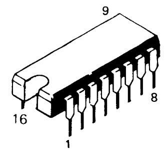
EHMS937H39S
EHMSJ12H37S
EHMSU27H38S



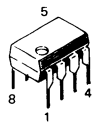
AN614



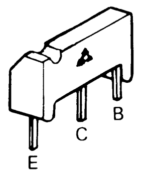
YWMC14050BCP
HD14572UBP
HD14053BP
TC4053BP
YWHD14516BP



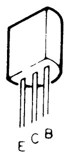
YHSNJM4558D



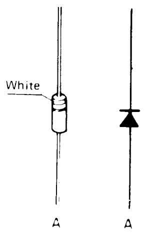
2SB643-QR
2SC2377-CD
2SD636-RS
2SD638-QR



2SC641K-C



MA165



COND

D

C

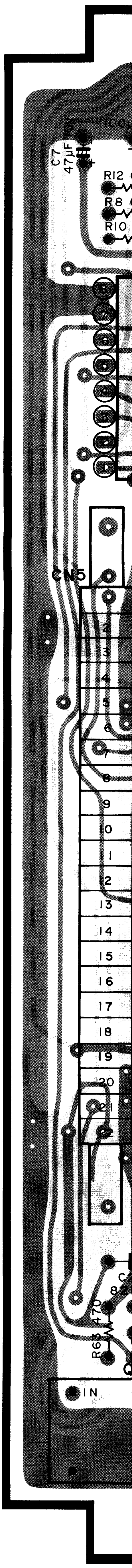
B

A

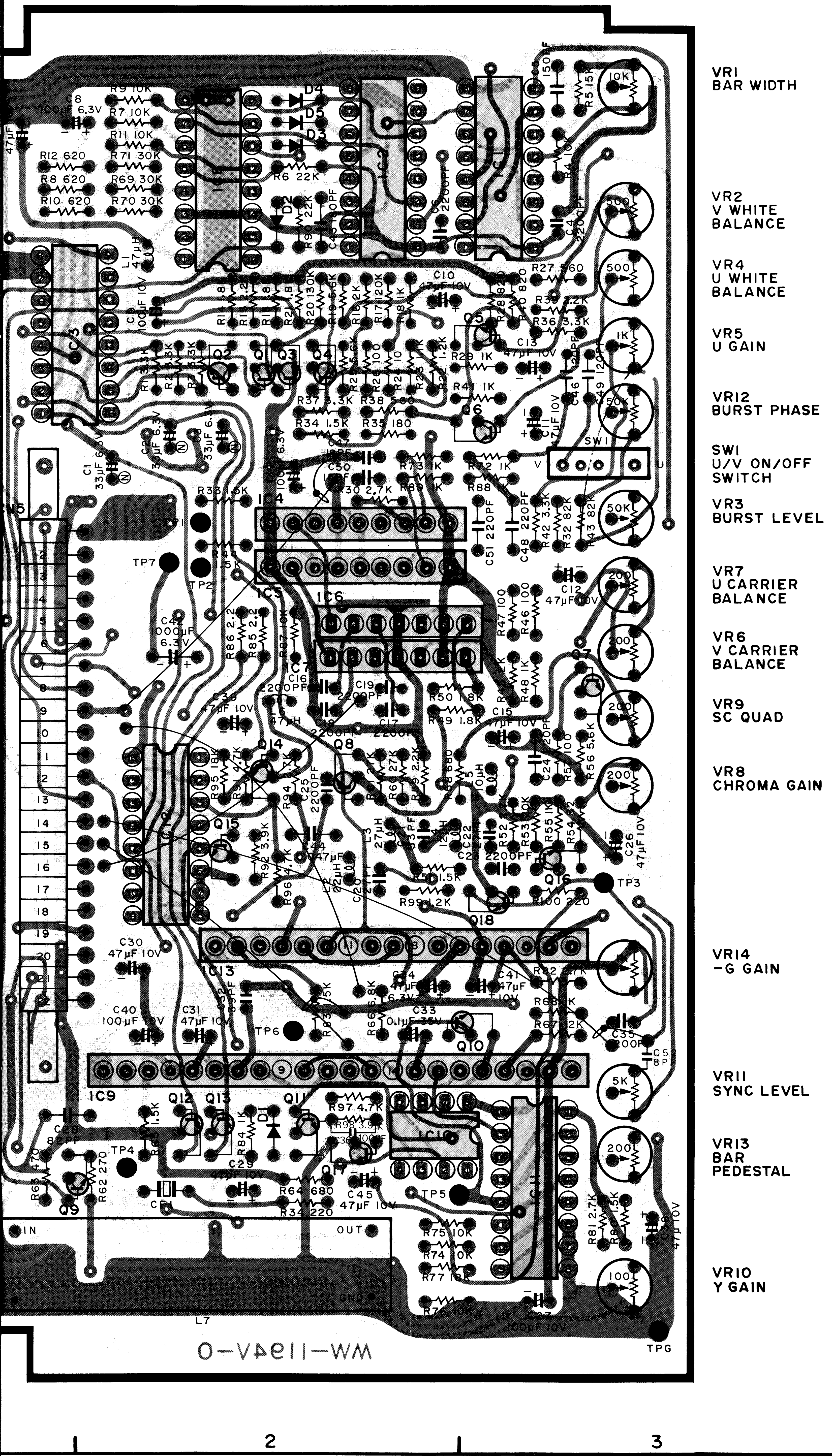
1

CN5

GND	1
R IN	2
G IN	3
B IN	4
BL IN	5
ENCODER BL IN	6
SYNC IN	7
BFP IN	8
CP IN	9
PAL OUT	10
+9.0V IN	11
PIX OUT	12
CAMERA/BAR SELECT IN	13
CHROMA OUT	14
R-Y(V)SC IN	15
Y OUT	16
PIX CONT (A) IN	17
PIX CONT (B) IN	18
PIX CONT (C) IN	19
PIX CONT (D) IN	20
B-Y (U) SC IN	21
GND	22

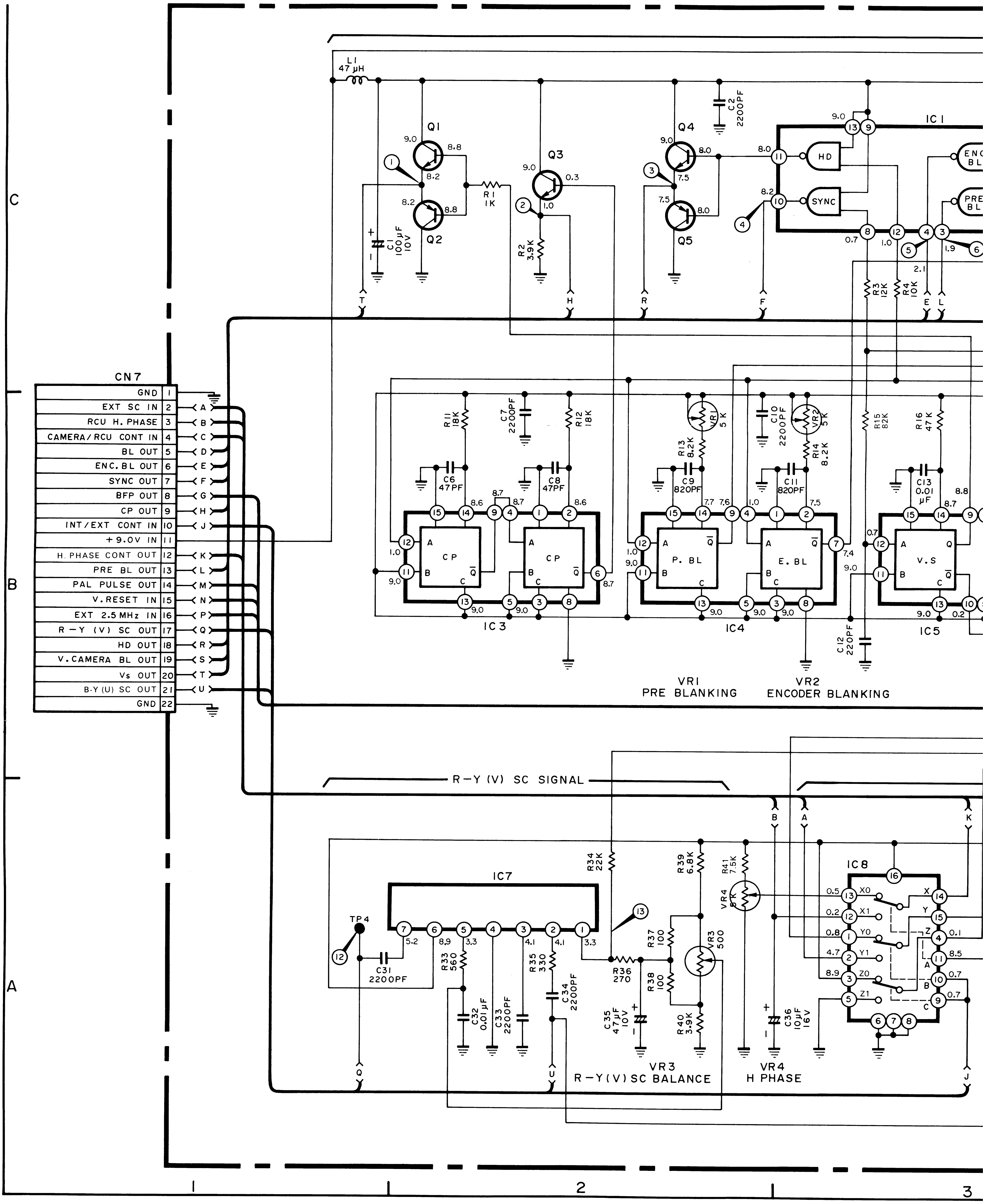

C7
47μF
10V
100
R12
R8
R10
CN5
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
C
8
470
R63
Q
IN

CONDUCTOR VIEW OF ENCODER BOARD


VR1
BAR WIDTH
VR2
V WHITE
BALANCE
VR4
U WHITE
BALANCE
VR5
U GAIN
VR12
BURST PHASE
SW1
U/V ON/OFF
SWITCH
VR3
BURST LEVEL
VR7
U CARRIER
BALANCE
VR6
V CARRIER
BALANCE
VR9
SC QUAD
VR8
CHROMA GAIN
VR14
−G GAIN
VR11
SYNC LEVEL
VR13
BAR
PEDESTAL
VR10
Y GAIN
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
IC11
IC13
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TPG
IN
OUT
GND
L7
WM-1194V-0
2
3

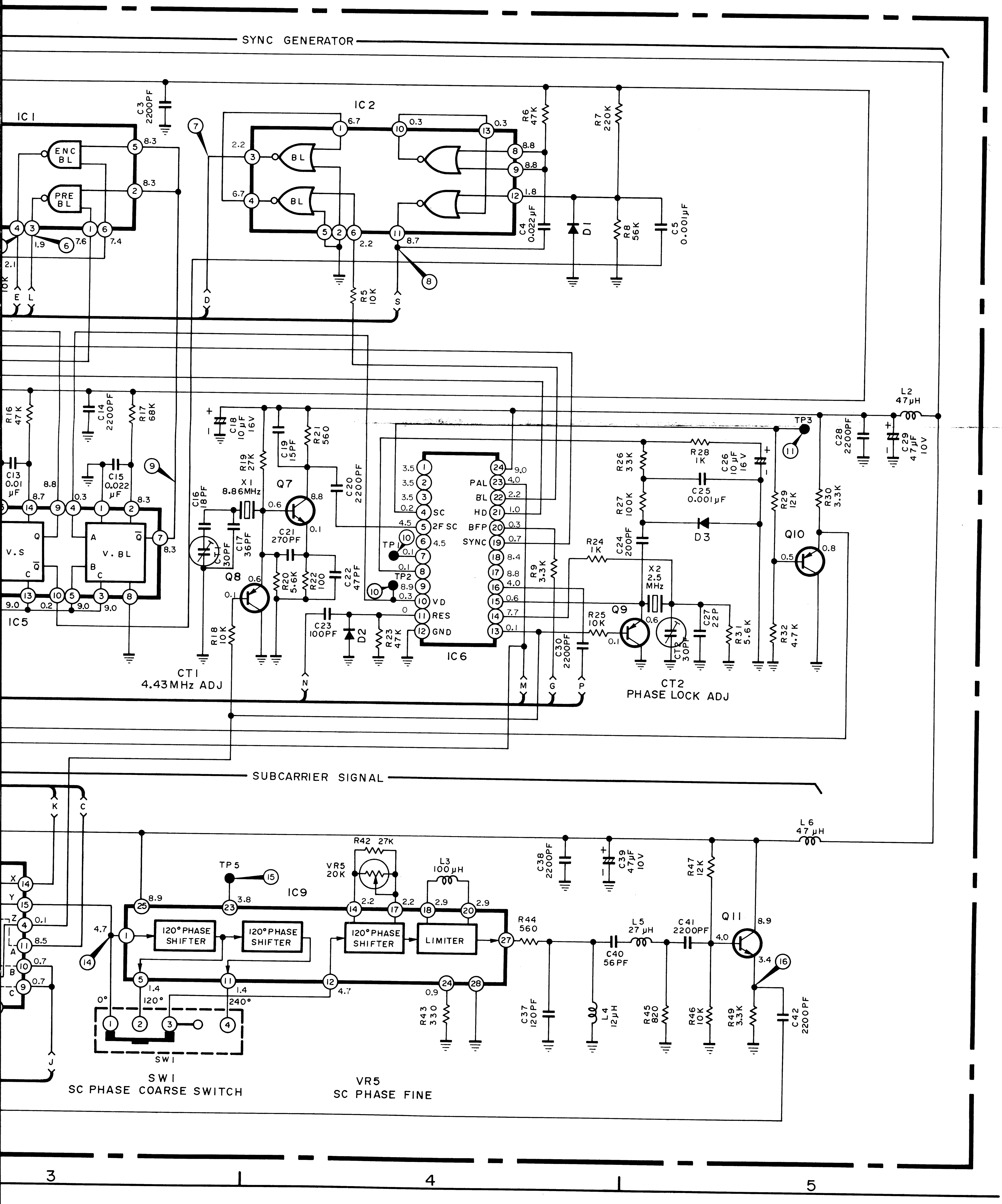
IC1	HD14572UBP	D2, D3
IC2	YWHD14516BP	D2
IC3	HD14053BP	C1, C2, D1, D2
IC4	EHMSJ12H37S	C2
IC5	EHMSJ12H37S	C2
IC6	AN614	C2, C3
IC7	AN614	C2, C3
IC8	YWMC14050BCP	D2
IC9	EHMS937H39S	A2, A3, B2, B3
IC10	YHSNJM4558D	A2, A3
IC11	TC4053BP	A3
IC12	HD14053BP	B2
IC13	EHMSU27H38S	B2, B3
Q1	2SD636-RS	C2, D2
Q2	2SD636-RS	C2, D2
Q3	2SD636-RS	C2, D2
Q4	2SD636-RS	C2, D2
Q5	2SD636-RS	D2, D3
Q6	2SD636-RS	C2, C3
Q7	2SD636-RS	B3, C3
Q8	2SD636-RS	B2
Q9	2SD636-RS	A1, A2
Q10	2SC641K-C	B2, B3
Q11	2SD636-RS	A2
Q12	2SD638-QR	A2
Q13	2SB643-QR	A2
Q14	2SC2377-CD	B2
Q15	2SC641K-C	B2
Q16	2SD636-RS	B3
Q17	2SC641K-C	A2
Q18	2SD636-RS	B2, B3
D1	MA165	A2
D2	MA165	D2
D3	MA165	D2
D4	MA165	D2
D5	MA165	D2

SCHEMATIC DIAGRA


CN7
GND 1
EXT SC IN 2
RCU H. PHASE 3
CAMERA/RCU CONT IN 4
BL OUT 5
ENC. BL OUT 6
SYNC OUT 7
BFP OUT 8
CP OUT 9
INT/EXT CONT IN 10
+9.0V IN 11
H. PHASE CONT OUT 12
PRE BL OUT 13
PAL PULSE OUT 14
V. RESET IN 15
EXT 2.5MHz IN 16
R-Y (V) SC OUT 17
HD OUT 18
V. CAMERA BL OUT 19
Vs OUT 20
B-Y (U) SC OUT 21
GND 22
L1 47μH
Q1
Q2
Q3
Q4
Q5
C1 100μF 10V
R1 1K
R2 3.9K
C2 2200PF
IC1
HD
SYNC
ENC BL
PRE BL
R3 12K
R4 10K
R11 18K
C7 2200PF
R12 18K
C6 47PF
C8 47PF
CP
IC3
R13 8.2K
VR1 5K
C9 820PF
C10 2200PF
VR2 5K
R14 8.2K
C11 820PF
P. BL
E. BL
IC4
R15 82K
R16 47K
C13 0.01μF
V.S
IC5
C12 220PF
VR1 PRE BLANKING
VR2 ENCODER BLANKING
R-Y (V) SC SIGNAL
IC7
TP4
C31 2200PF
R33 560
C32 0.01μF
C33 2200PF
R35 330
C34 2200PF
R34 22K
R36 270
R37 100
R38 100
R39 6.8K
VR3 500
R40 3.9K
C35 47μF 10V
R41 7.5K
VR4 5K
C36 10μF 16V
IC8
X0
X1
Y0
Y1
Z0
Z1
VR3 R-Y(V) SC BALANCE
VR4 H PHASE
C
B
A
1
2
3

IC1	HD14011BP	C3	IC6	MN6065	B4	Q1	2SD636-RS	C2	Q7	2SC828-QR	B4
IC2	YWHD14001BP	C4	IC7	AN614	A2	Q2	2SB641-RS	C2	Q8	2SB643-QR	B4
IC3	TC4538BP	B2	IC8	HD14053BP	A3	Q3	2SD636-RS	C2	Q9	2SB643-QR	B5
IC4	YWHD14538BP	B2, B3	IC9	EHMS653C10S	A3, A4	Q4	2SD636-RS	C2	Q10	2SB641-RS	B5
IC5	YWHD14538BP	B3				Q5	2SB641-RS	C2	Q11	2SD636-RS	A5

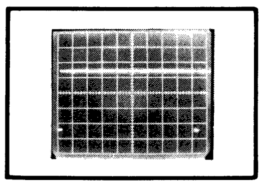
AGRAM OF SYNC-1 BOARD


SYNC GENERATOR
IC1
ENC BL
PRE BL
IC2
BL
C3 2200PF
R6 47K
R7 220K
C4 0.022µF
D1
R8 56K
C5 0.001µF
R5 10K
E
L
D
S
IC5
V.S
V.BL
R16 47K
C14 2200PF
R17 68K
C13 0.01 µF
C15 0.022 µF
C18 10µF 16V
R19 27K
C19 15PF
R21 560
C20 2200PF
X1 8.86MHz
Q7
C16 18PF
C17 36PF
C21 270PF
CT1 30PF
Q8
R20 5.6K
R22 100
C22 47PF
R18 10K
CT1
4.43MHz ADJ
C23 100PF
D2
R23 47K
TP1
TP2
IC6
SC
2F SC
VD
RES
GND
PAL
BL
HD
BFP
SYNC
R9 3.3K
C30 2200PF
N
M
G
P
R26 33K
R28 1K
C26 10µF 16V
C25 0.001µF
R27 100K
D3
R24 1K
C24 200PF
X2 2.5 MHz
R25 10K
Q9
CT2 30PF
C27 22P
R31 5.6K
R29 12K
R30 3.3K
Q10
R32 4.7K
CT2
PHASE LOCK ADJ
L2 47µH
TP3
C28 2200PF
C29 47µF 10V
SUBCARRIER SIGNAL
K
C
L6 47µH
C38 2200PF
C39 47µF 10V
R42 27K
VR5 20K
L3 100µH
TP5
IC9
120° PHASE SHIFTER
120° PHASE SHIFTER
120° PHASE SHIFTER
LIMITER
R44 560
L5 27µH
C41 2200PF
C40 56PF
R47 12K
Q11
C37 120PF
L4 12µH
R45 820
R46 10K
R49 3.3K
C42 2200PF
R43 330
0°
120°
240°
SW1
J
SW1
SC PHASE COARSE SWITCH
VR5
SC PHASE FINE
3
4
5

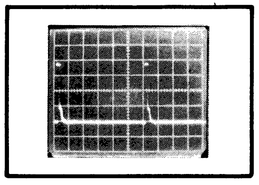
B4	D1	MA165	C4
B4	D2	MA165	B4
B5	D3	YUD1S2139C	B5
B5			
A5			

SIGNAL WAVEFORMS OF SYNC-1 BOARD

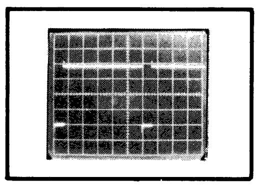
1 2V/DIV, 2ms/DIV



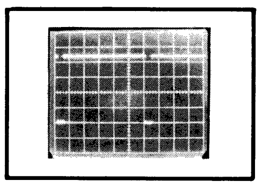
2 2V/DIV, 10μs/DIV



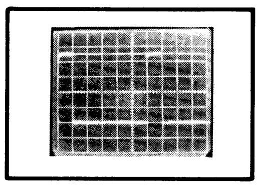
3 2V/DIV, 10μs/DIV



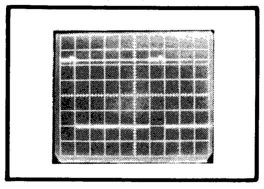
4 2V/DIV, 10μs/DIV



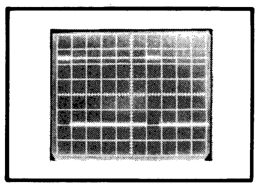
5 2V/DIV, 10μs/DIV



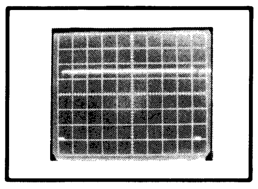
6 2V/DIV, 10μs/DIV



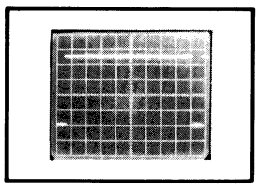
7 2V/DIV, 10μs/DIV



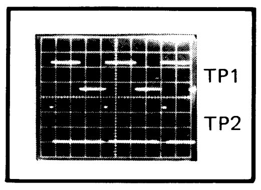
8 2V/DIV, 2ms/DIV



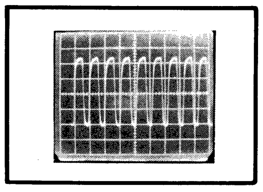
9 2V/DIV, 2ms/DIV



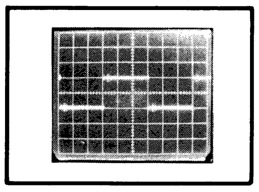
10 5V/DIV, 5ms/DIV



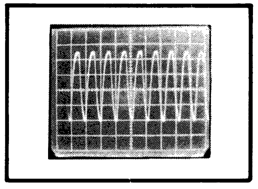
11 2V/DIV, 0.2μs/DIV



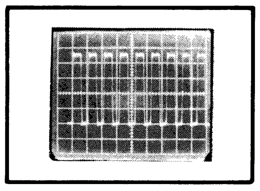
12 50mV/DIV, 20μs/DIV



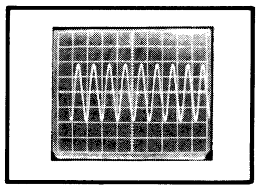
13 0.5V/DIV, 0.2μs/DIV



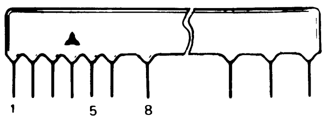
14 0.5V/DIV, 0.2μs/DIV



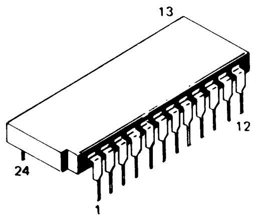
15 0.1V/DIV, 0.2μs/DIV



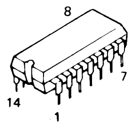
EHMS653C10S



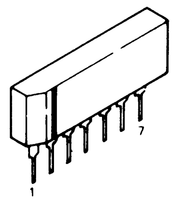
MN6065



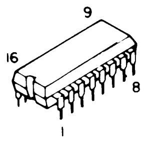
HD14011BP
YWHD14001BP



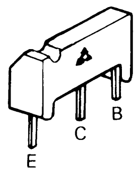
AN614



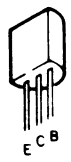
TC4538BP
HD14053BP
YFHD14557BP
YWHD14538BP



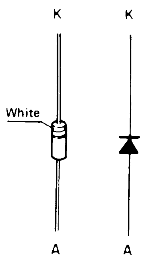
2SB641-RS
2SB643-QR
2SD636-RS



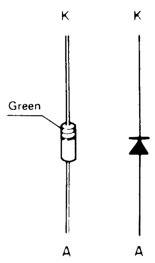
2SC828-QR



MA165



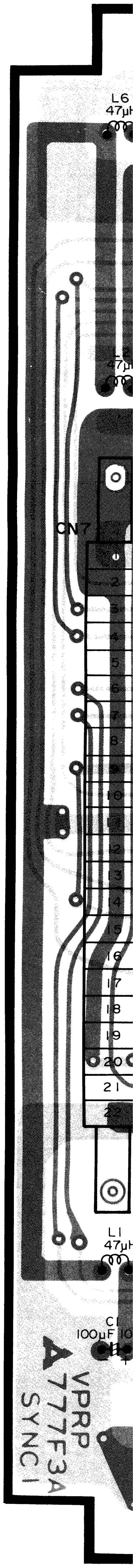
YUD1S2139C



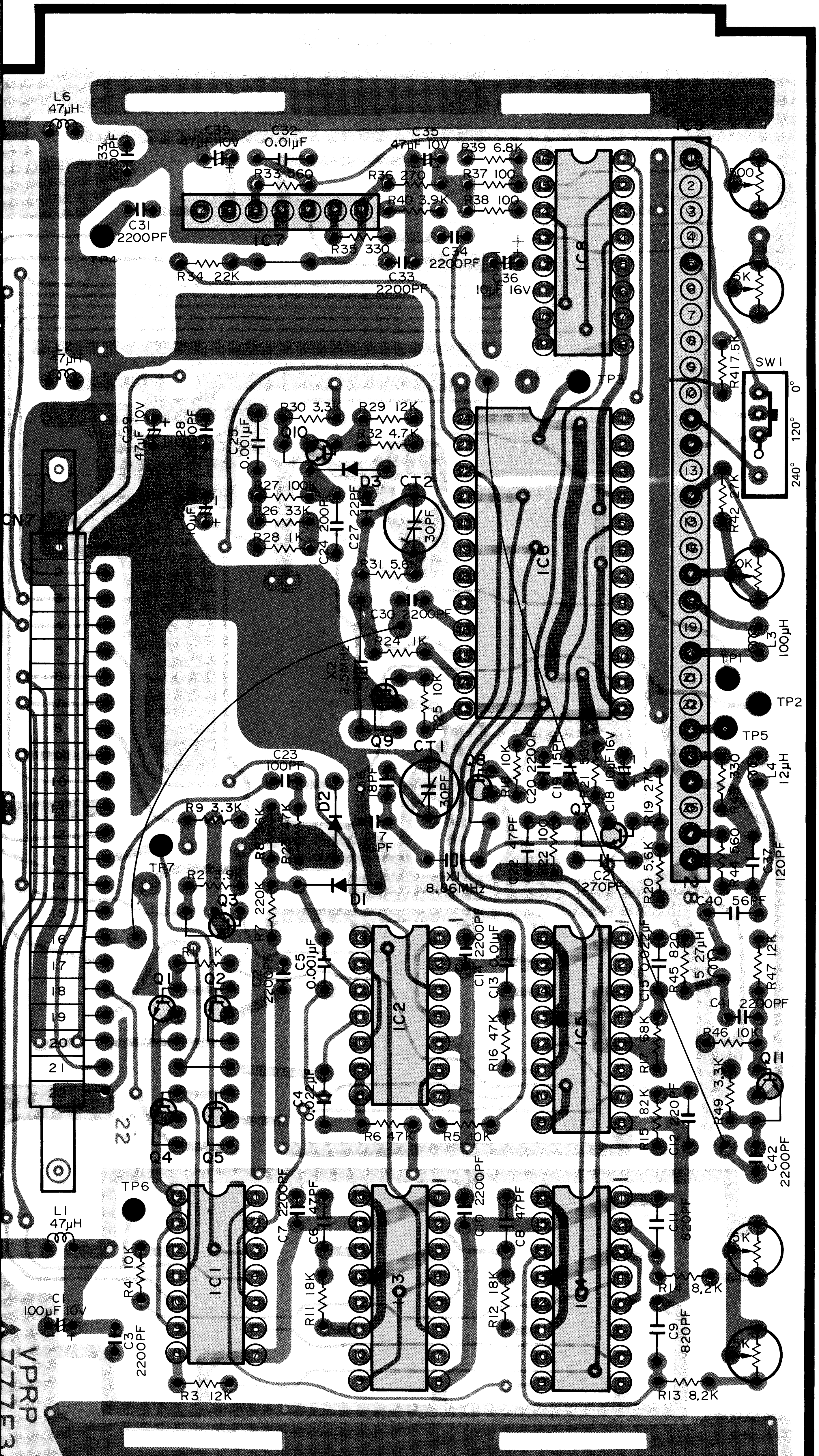
CONDUCT

CN 7

GND	1
EXT SC IN	2
PCU H. PHASE	3
CAMERA/RCU CONT IN	4
BL OUT	5
ENC. BL OUT	6
SYNC OUT	7
BFP OUT	8
CP OUT	9
INT/EXT CONT IN	10
+9.0V IN	11
H. PHASE CONT OUT	12
PRE BL OUT	13
PAL PULSE OUT	14
V. RESET IN	15
EXT 2.5MHz IN	16
R-Y(V) SC OUT	17
HD OUT	18
V. CAMERA BL OUT	19
Vs OUT	20
B-Y (U) SC OUT	21
GND	22


D
C
B
A
1
L6
47μH
CN7
L1
47μH
C1
100μF
VPRP
777F3A
SYNC 1

UCTOR VIEW OF SYNC-1 BOARD


L6 47μH
C39 47μF 10V
C32 0.01μF
C35 47μF 10V
R39 6.8K
R33 560
R36 270
R37 100
R40 3.9K
R38 100
C31 2200PF
TP4
IC7
R35 330
R34 22K
C33 2200PF
C34 2200PF
C36 10μF 16V
IC8
TP3
R41 7.5K
SW1
0°
120°
240°
R30 3.3K
R29 12K
Q10
R32 4.7K
C29 0.001μF
D3
CT2
R27 100K
R26 33K
R28 1K
C27 22PF
C24 200PF
30PF
R31 5.6K
IC6
CN7
R42 2.7K
C30 2200PF
R24 1K
X2 2.5MHz
R25 10K
L3 100μH
TP1
TP2
Q9
CT1
TP5
C23 100PF
Q8
L4 12μH
R9 3.3K
D2
R22
R19 2.7K
TP7
R2 3.9K
X1 8.86MHz
C21 270PF
R20 5.6K
R44 560
C37 120PF
Q3
R7 220K
D1
C40 56PF
C5 0.001μF
C14 2200PF
C13 0.01μF
C15 0.022μF
R45 820
L5 27μH
R47 12K
Q1
Q2
C2 2200PF
IC2
IC5
C41 2200PF
R46 10K
R16 47K
R17 68K
Q11
C4 0.22μF
R49 3.3K
R6 47K
R5 10K
R15 82K
C12 220PF
C42 2200PF
Q4
Q5
22
TP6
C7 2200PF
C6 47PF
C10 2200PF
C8 47PF
C11 820PF
L1 47μH
R4 10K
IC1
R11 18K
IC3
R12 18K
IC4
R14 8.2K
C1 100μF 10V
C3 2200PF
C9 820PF
R3 12K
R13 8.2K
VPRP 777E3
2
3

VR 3
R–Y (V)
SC BALANCE

VR4
H PHASE

SW I
SC PHASE
COARSE
SWITCH

CT2
PHASE LOCK
ADJ

VR5
SC PHASE
FINE

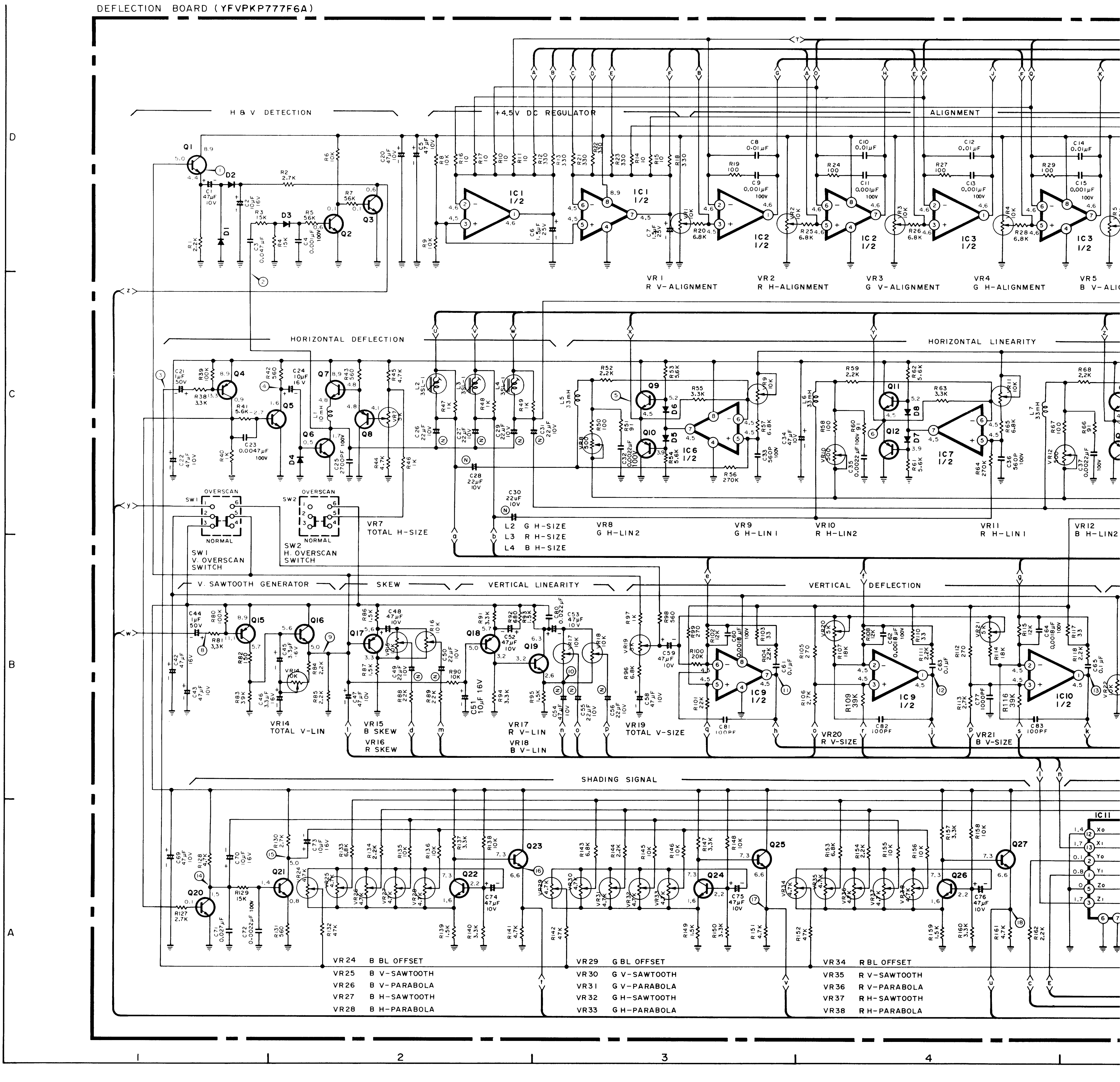
CT I
4.43MHz
ADJ

VR 2
ENCODER
BLANKING

VR I
PRE
BLANKING

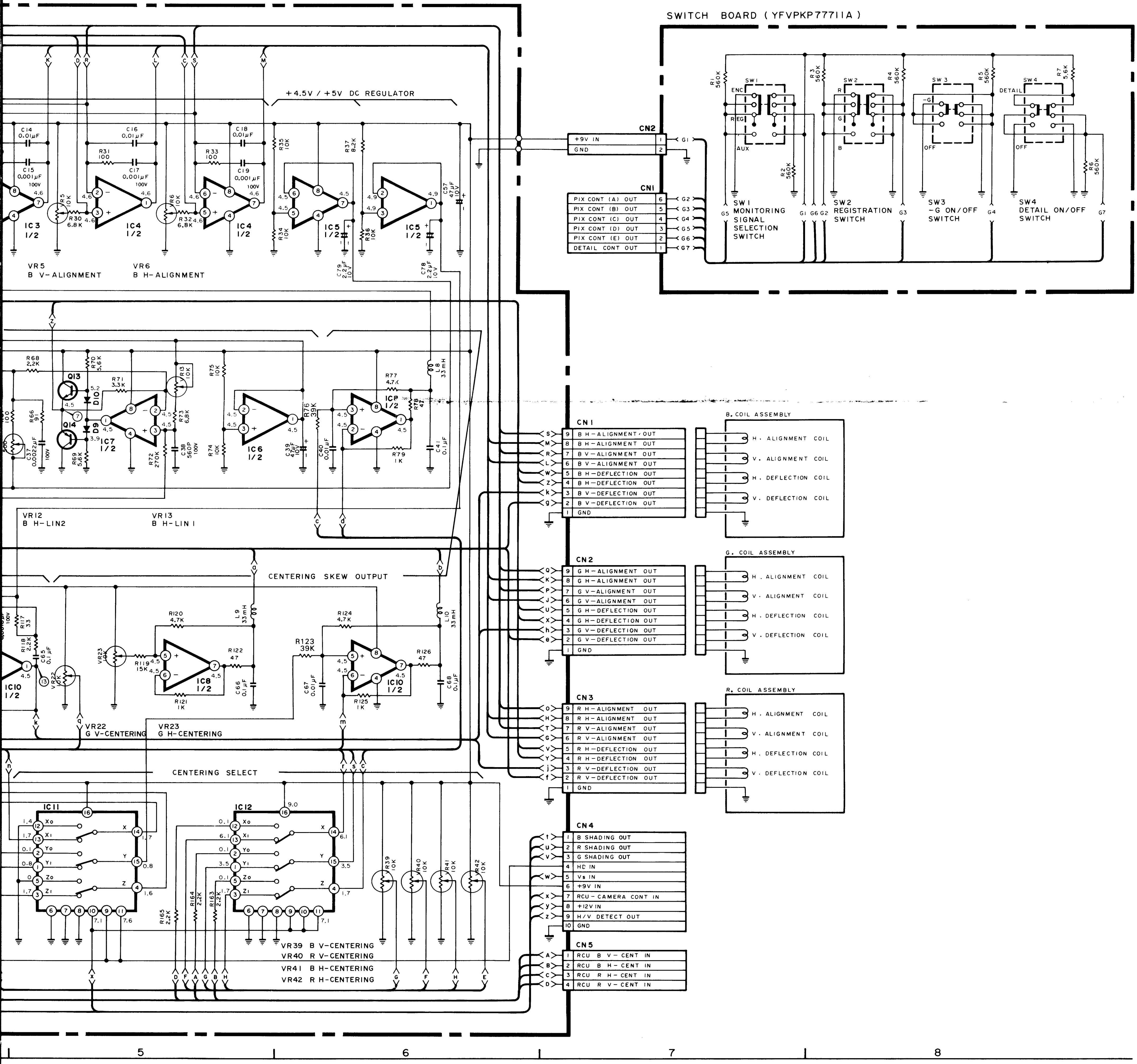
IC1	HD14011BP	A2, B2
IC2	YWHD14001BP	B2
IC3	TC4538BP	A2, B2
IC4	YWHD14538BP	A3, B3
IC5	YWHD14538BP	B3
IC6	MN6065	C2, C3
IC7	AN614	D2
IC8	HD14053BP	D3
IC9	EHMS653C10S	B3, C3, D3
Q1	2SD636-RS	B2
Q2	2SB641-RS	B2
Q3	2SD636-RS	B2
Q4	2SD636-RS	B2
Q5	2SB641-RS	B2
Q7	2SC828-QR	B3
Q8	2SB643-QR	B2, C2
Q9	2SB643-QR	C2
Q10	2SB641-RS	C2
Q11	2SD636-RS	B3
D1	MA165	B2
D2	MA165	B2, C2
D3	YUD1S2139C	C2

SCHEMATIC DIAGRAM


DEFLECTION BOARD (YFVPKP777F6A)
H & V DETECTION
+4.5V DC REGULATOR
ALIGNMENT
VR1 R V-ALIGNMENT
VR2 R H-ALIGNMENT
VR3 G V-ALIGNMENT
VR4 G H-ALIGNMENT
HORIZONTAL DEFLECTION
HORIZONTAL LINEARITY
OVERSCAN
NORMAL
SW1 V. OVERSCAN SWITCH
SW2 H. OVERSCAN SWITCH
VR7 TOTAL H-SIZE
L2 G H-SIZE
L3 R H-SIZE
L4 B H-SIZE
VR8 G H-LIN2
VR9 G H-LIN1
VR10 R H-LIN2
VR11 R H-LIN1
VR12 B H-LIN2
V. SAWTOOTH GENERATOR
SKEW
VERTICAL LINEARITY
VERTICAL DEFLECTION
VR14 TOTAL V-LIN
VR15 B SKEW
VR16 R SKEW
VR17 R V-LIN
VR18 B V-LIN
VR19 TOTAL V-SIZE
VR20 R V-SIZE
VR21 B V-SIZE
SHADING SIGNAL
VR24 B BL OFFSET
VR25 B V-SAWTOOTH
VR26 B V-PARABOLA
VR27 B H-SAWTOOTH
VR28 B H-PARABOLA
VR29 G BL OFFSET
VR30 G V-SAWTOOTH
VR31 G V-PARABOLA
VR32 G H-SAWTOOTH
VR33 G H-PARABOLA
VR34 R BL OFFSET
VR35 R V-SAWTOOTH
VR36 R V-PARABOLA
VR37 R H-SAWTOOTH
VR38 R H-PARABOLA
IC11
D
C
B
A
1
2
3
4

IC1	NJM4556D	D2, D3	IC8	NJM4556D	C6, B5	Q1	2SD636-RS	D1	Q8	2SA564-RS	C2	Q15	2SB641-R
IC2	NJM4556D	D3, D4	IC9	NJM4556D	B3, B4	Q2	2SD636-RS	D2	Q9	2SD636-RS	C3	Q16	2SD636-R
IC3	NJM4556D	D4, D5	IC10	NJM4556D	B4, B5, B6	Q3	2SD636-RS	D2	Q10	2SB641-RS	C3	Q17	2SB641-R
IC4	NJM4556D	D5	IC11	YWMC14053BCP	A5	Q4	2SB641-RS	C1	Q11	2SC828-RS	C4	Q18	2SB641-R
IC5	NJM4556D	D6	IC12	YWMC14053BCP	A5, A6	Q5	2SD638-QR	C2	Q12	2SB641-RS	C4	Q19	2SD636-R
IC6	NJM4556D	C3, C5				Q6	2SD959-PQ	C2	Q13	2SD636-RS	C5	Q20	2SD636-R
IC7	NJM4556D	C4, C5				Q7	2SC1567-QR	C2	Q14	2SB641-RS	C5	Q21	2SD636-R

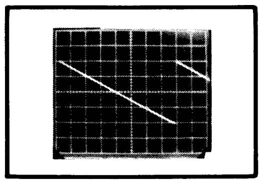
RAM OF DEFLECTION BOARD

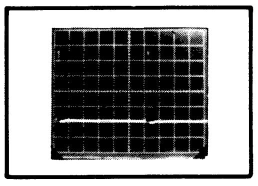


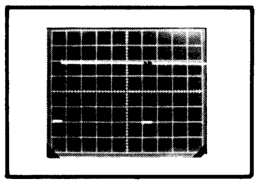
SWITCH BOARD (YFVPKP77711A)
+4.5V / +5V DC REGULATOR
CN2
+9V IN
GND
CN1
PIX CONT (A) OUT
PIX CONT (B) OUT
PIX CONT (C) OUT
PIX CONT (D) OUT
PIX CONT (E) OUT
DETAIL CONT OUT
SW1 MONITORING SIGNAL SELECTION SWITCH
SW2 REGISTRATION SWITCH
SW3 -G ON/OFF SWITCH
SW4 DETAIL ON/OFF SWITCH
ENC
REG
AUX
DETAIL
OFF
IC3 1/2
IC4 1/2
IC5 1/2
VR5 B V-ALIGNMENT
VR6 B H-ALIGNMENT
Q13
Q14
D9
D10
IC7 1/2
IC6 1/2
IC9 1/2
VR12 B H-LIN2
VR13 B H-LIN1
L8 33mH
CENTERING SKEW OUTPUT
IC8 1/2
IC10 1/2
L9 33mH
L10 33mH
VR22 G V-CENTERING
VR23 G H-CENTERING
CENTERING SELECT
IC11
IC12
VR39 B V-CENTERING
VR40 R V-CENTERING
VR41 B H-CENTERING
VR42 R H-CENTERING
CN1
B H-ALIGNMENT OUT
B H-ALIGNMENT OUT
B V-ALIGNMENT OUT
B V-ALIGNMENT OUT
B H-DEFLECTION OUT
B H-DEFLECTION OUT
B V-DEFLECTION OUT
B V-DEFLECTION OUT
GND
B. COIL ASSEMBLY
H. ALIGNMENT COIL
V. ALIGNMENT COIL
H. DEFLECTION COIL
V. DEFLECTION COIL
CN2
G H-ALIGNMENT OUT
G H-ALIGNMENT OUT
G V-ALIGNMENT OUT
G V-ALIGNMENT OUT
G H-DEFLECTION OUT
G H-DEFLECTION OUT
G V-DEFLECTION OUT
G V-DEFLECTION OUT
GND
G. COIL ASSEMBLY
CN3
R H-ALIGNMENT OUT
R H-ALIGNMENT OUT
R V-ALIGNMENT OUT
R V-ALIGNMENT OUT
R H-DEFLECTION OUT
R H-DEFLECTION OUT
R V-DEFLECTION OUT
R V-DEFLECTION OUT
GND
R. COIL ASSEMBLY
CN4
B SHADING OUT
R SHADING OUT
G SHADING OUT
HC IN
Vs IN
+9V IN
RCU-CAMERA CONT IN
+12V IN
H/V DETECT OUT
GND
CN5
RCU B V-CENT IN
RCU B H-CENT IN
RCU R H-CENT IN
RCU R V-CENT IN
5
6
7
8

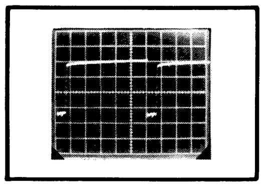
2SB641-RS	B1	Q22	2SD636-RS	A2	D1	MA165	D1	D8	MA165	C4
2SD636-RS	B2	Q23	2SD636-RS	A2	D2	MA165	D1	D9	MA165	C5
2SB641-RS	B2	Q24	2SD636-RS	A3	D3	MA165	D2	D10	MA165	C5
2SB641-RS	B2	Q25	2SD636-RS	A3	D4	MA165	C2			
2SD636-RS	B2, B3	Q26	2SD636-RS	A4	D5	MA165	C3			
2SD636-RS	A1	Q27	2SD636-RS	A4	D6	MA165	C3			
2SD636-RS	A2				D7	MA165	C4			

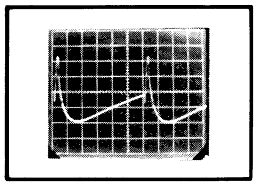
SIGNAL WAVEFORMS OF DEFLECTION BOARD

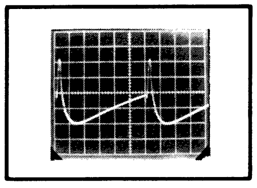

1 0.5V/DIV, 2ms/DI

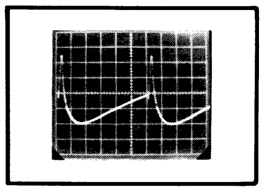

2 20V/DIV, 10μs/DIV

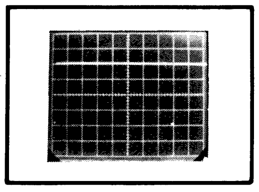

3 2V/DIV, 10μs/DIV

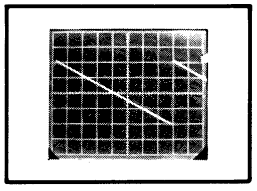

4 0.5V/DIV, 10μs/DIV

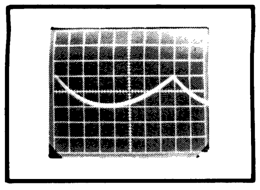

5 0.5V/DIV, 10μs/DIV

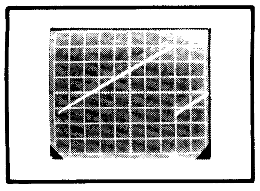

6 0.5V/DIV, 10μs/DIV

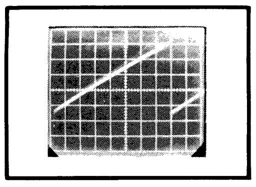

7 0.5V/DIV, 10μs/DIV

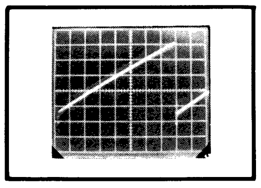

8 2V/DIV, 2ms/DIV

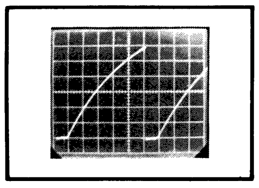

9 0.5V/DIV, 2ms/DIV

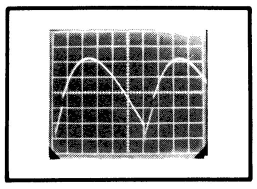

10 0.5V/DIV, 2ms/DIV

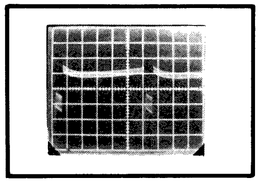

11 1V/DIV, 2ms/DIV

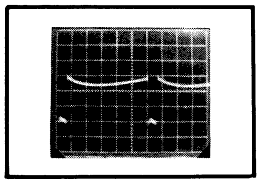

12 1V/DIV, 2ms/DIV

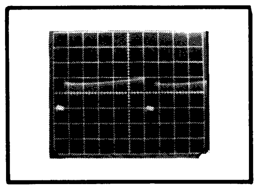

13 1V/DIV, 2ms/DIV


14 0.5V/DIV, 10μs/DIV

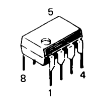

15 0.5V/DIV, 10μs/DIV


16 0.02V/DIV, 10μs/DIV

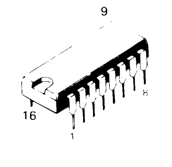

17 0.1V/DIV, 10μs/DIV


18 0.1V/DIV, 10μs/DIV

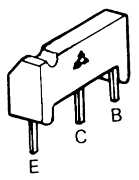
NJM4556D



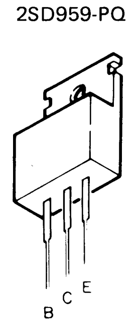
YWMC14053BCP



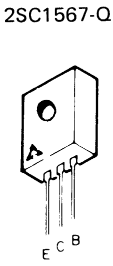
2SD636-RS
2SB641-RS
2SD638-QR
2SA564-RS



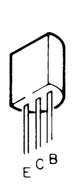
2SD959-PQ



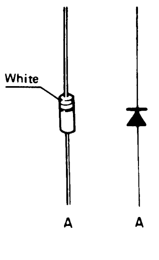
2SC1567-QR



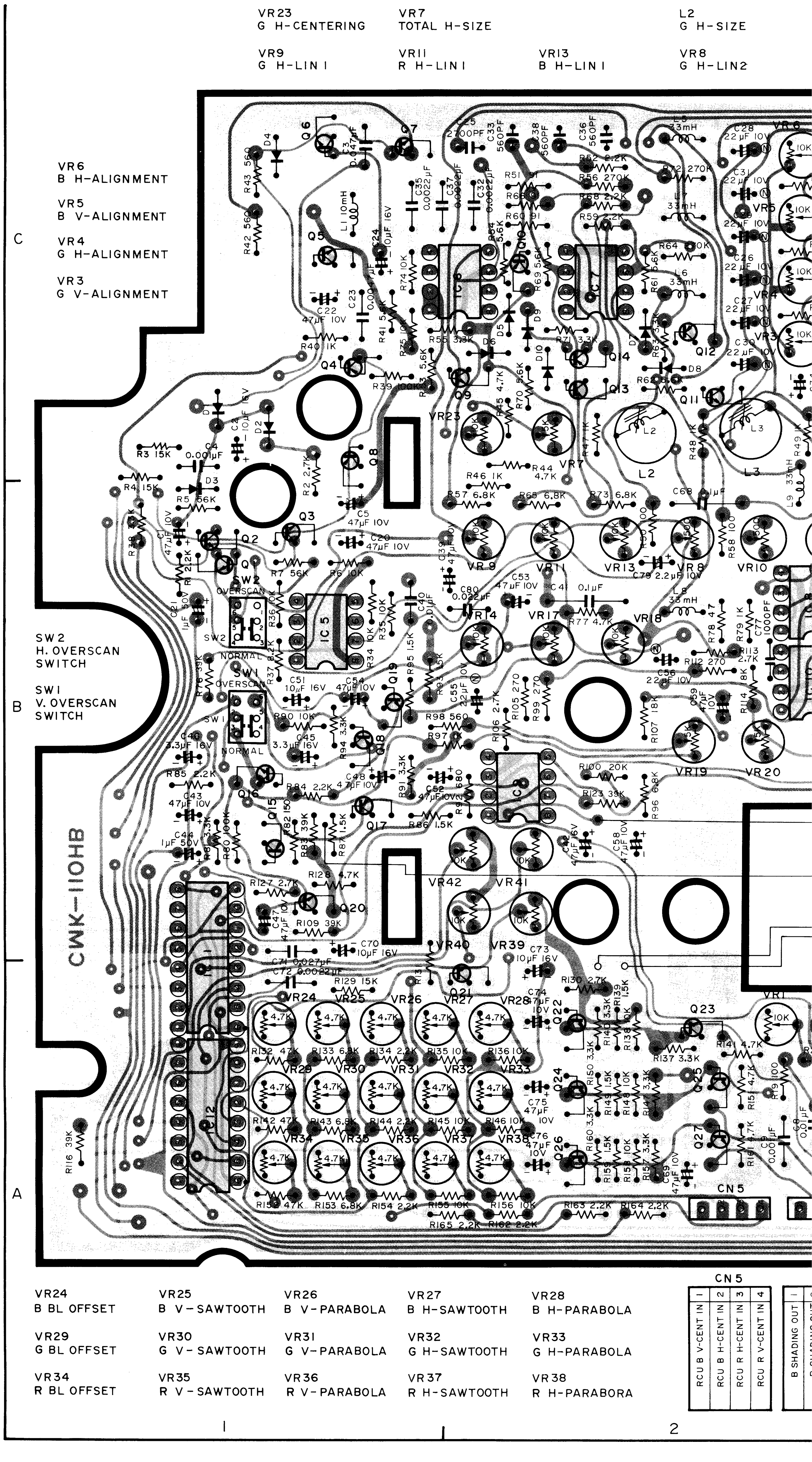
2SC828-RS



MA165



CONDUCTO



VR23
G H-CENTERING

VR7
TOTAL H-SIZE

L2
G H-SIZE

VR9
G H-LIN I

VR11
R H-LIN I

VR13
B H-LIN I

VR8
G H-LIN2

VR6
B H-ALIGNMENT

VR5
B V-ALIGNMENT

VR4
G H-ALIGNMENT

VR3
G V-ALIGNMENT

SW2
H. OVERSCAN
SWITCH

SW1
V. OVERSCAN
SWITCH

VR24 B BL OFFSET	VR25 B V-SAWTOOTH	VR26 B V-PARABOLA	VR27 B H-SAWTOOTH	VR28 B H-PARABOLA
VR29 G BL OFFSET	VR30 G V-SAWTOOTH	VR31 G V-PARABOLA	VR32 G H-SAWTOOTH	VR33 G H-PARABOLA
VR34 R BL OFFSET	VR35 R V-SAWTOOTH	VR36 R V-PARABOLA	VR37 R H-SAWTOOTH	VR38 R H-PARABORA

IC1	NJM4556D	B3	IC9	NJM4556D	B2	Q4	2SB641-RS	C1	C
IC2	NJM4556D	A2, A3	IC10	NJM4556D	B2	Q5	2SD638-QR	C1	C
IC3	NJM4556D	C3	IC11	YWMC14053BCP	A1, B1	Q6	2SD959-PQ	C1	C
IC4	NJM4556D	C3	IC12	YWMC14053BCP	A1	Q7	2SC1567-QR	C1	C
IC5	NJM4556D	B1				Q8	2SA564-RS	C1	C
IC6	NJM4556D	C1, C2	Q1	2SD636-RS	B1	Q9	2SD636-RS	C2	C
IC7	NJM4556D	C2	Q2	2SD636-RS	B1	Q10	2SB641-RS	C2	C
IC8	NJM4556D	B2	Q3	2SD636-RS	B1	Q11	2SC828-RS	C2	C

CTOR VIEW OF DEFLECTION BOARD

E

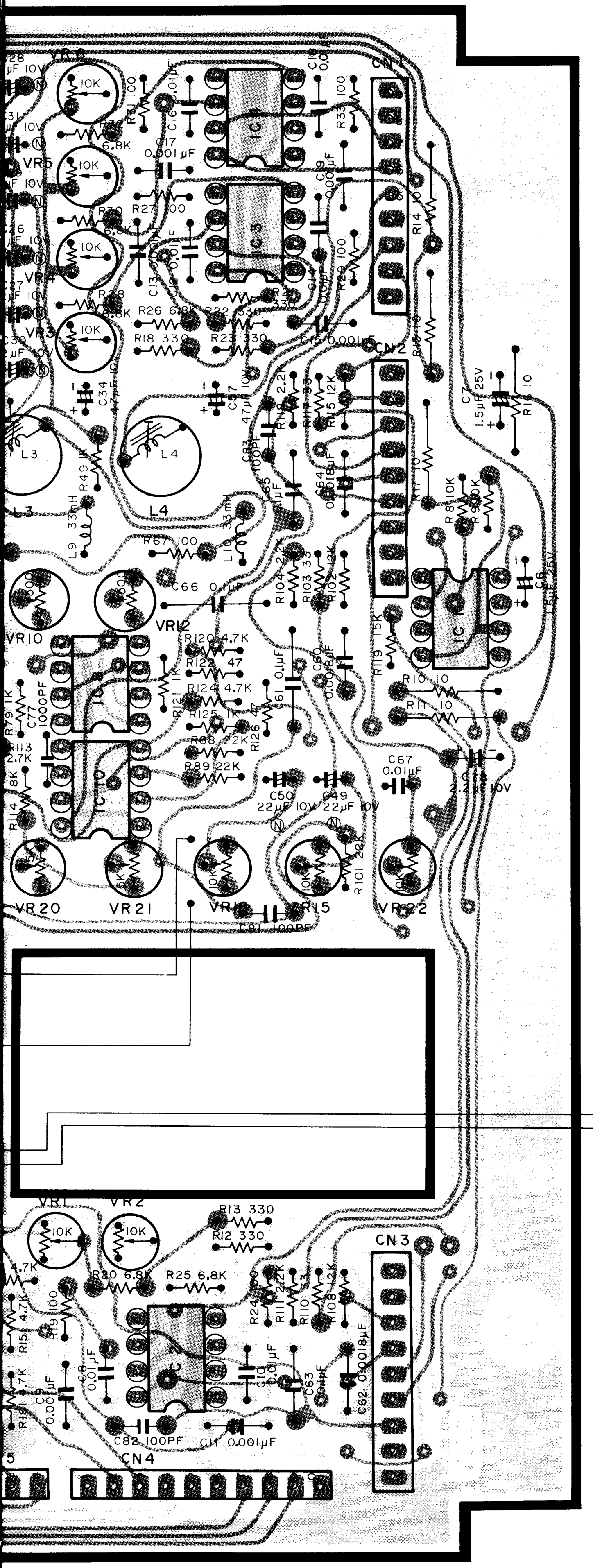
2

L3
R H-SIZE

VR10
R H-LIN2

L4
B H-SIZE

VR12
B H-LIN2


VR6
VR5
VR4
VR3
10K
IC1
IC3
IC4
IC5
IC2
L3
L4
L9 33mH
L10 33mH
VR10
VR12
VR20
VR21
VR16
VR15
VR22
VR1
VR2
CN1
CN2
CN3
CN4
5
R13 330
R12 330
R20 6.8K
R25 6.8K
C82 100PF
C11 0.001μF
C81 100PF
C67 0.01μF
C50 22μF 10V
C49 22μF 10V
C66 0.1μF
R67 100
R18 330
R23 330
R22 330
R26 6.8K
R27 100
C7 1.5μF 25V
R16 10
R10 10
R11 10
R119 15K
R120 4.7K
R122 47
R124 4.7K
R125 1K
R88 22K
R89 22K
C75 1000PF
R79 1K
R113 2.7K
R114 1.8K
C34 47μF 10V
C37 47μF 10V
R49 1K
R101 22K

CN1

9	B H-ALIGNMENT OUT
8	B H-ALIGNMENT OUT
7	B V-ALIGNMENT OUT
6	B V-ALIGNMENT OUT
5	B H-DEFLECTION OUT
4	B H-DEFLECTION OUT
3	B V-DEFLECTION OUT
2	B V-DEFLECTION OUT
1	GND

CN2

9	G H-ALIGNMENT OUT
8	G H-ALIGNMENT OUT
7	G V-ALIGNMENT OUT
6	G V-ALIGNMENT OUT
5	G H-DEFLECTION OUT
4	G H-DEFLECTION OUT
3	G V-DEFLECTION OUT
2	G V-DEFLECTION OUT
1	GND

VR14
TOTAL V-LIN

VR17
R V-LIN

VR18
B V-LIN

VR19
TOTAL V-SIZE

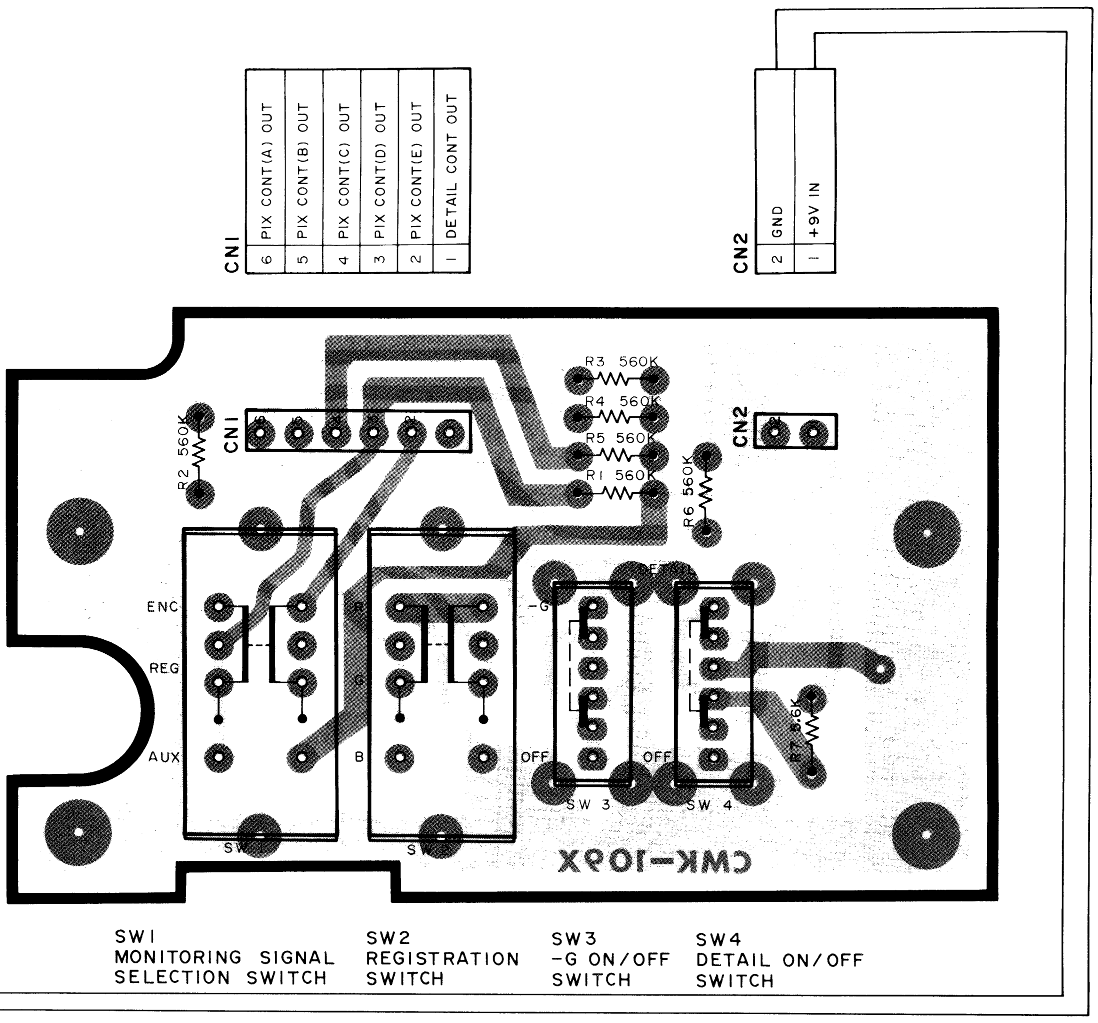
VR20
R V-SIZE

VR21
B V-SIZE

VR16
R SKEW

VR15
B SKEW

VR22
G V-CENTERING


CN1
CN2
R3 560K
R4 560K
R5 560K
R1 560K
R2 560K
R6 560K
R7 5.6K
ENC
REG
AUX
R
G
B
-G
DETAIL
OFF
OFF
SW1
SW2
SW 3
SW 4
CWK-109X

CN1

6	PIX CONT(A) OUT
5	PIX CONT(B) OUT
4	PIX CONT(C) OUT
3	PIX CONT(D) OUT
2	PIX CONT(E) OUT
1	DETAIL CONT OUT

CN2

2	GND
1	+9V IN

SW1
MONITORING SIGNAL
SELECTION SWITCH

SW2
REGISTRATION
SWITCH

SW3
-G ON/OFF
SWITCH

SW4
DETAIL ON/OFF
SWITCH

CN3

9	R H-ALIGNMENT OUT
8	R H-ALIGNMENT OUT
7	R V-ALIGNMENT OUT
6	R V-ALIGNMENT OUT
5	R H-DEFLECTION OUT
4	R H-DEFLECTION OUT
3	R V-DEFLECTION OUT
2	R V-DEFLECTION OUT
1	GND

5

3	4
RCU R H-CENT IN	RCU R V-CENT IN

CN 4

1	2	3	4	5	6	7	8	9	10
B SHADING OUT	R SHADING OUT	G SHADING OUT	HD IN	Vs IN	+9V IN	RCU-CAMERA CONT IN	+12V IN	H/V DETECT OUT	GND

VR42
R H-CENTERING

VR41
B H-CENTERING

VR40
R V-CENTERING

VR39
B V-CENTERING

VR1
R V-ALIGNMENT

VR2
R H-ALIGNMENT

3

Q12	2SB641-RS	C2	Q20	2SD636-RS	B1	D1	MA165	C1
Q13	2SD636-RS	C2	Q21	2SD636-RS	A2	D2	MA165	C1
Q14	2SB641-RS	C2	Q22	2SD636-RS	A2	D3	MA165	B1, C1
Q15	2SB641-RS	B1	Q23	2SD636-RS	A2	D4	MA165	C1
Q16	2SD636-RS	B1	Q24	2SD636-RS	A2	D5	MA165	C2
Q17	2SB641-RS	B1	Q25	2SD636-RS	A2	D6	MA165	C2
Q18	2SB641-RS	B1	Q26	2SD636-RS	A2	D7	MA165	C2
Q19	2SD636-RS	B1	Q27	2SD636-RS	A2	D8	MA165	C2
						D9	MA165	C2
						D10	MA165	C2

CTOR VIEW OF DEFLECTION BOARD

E

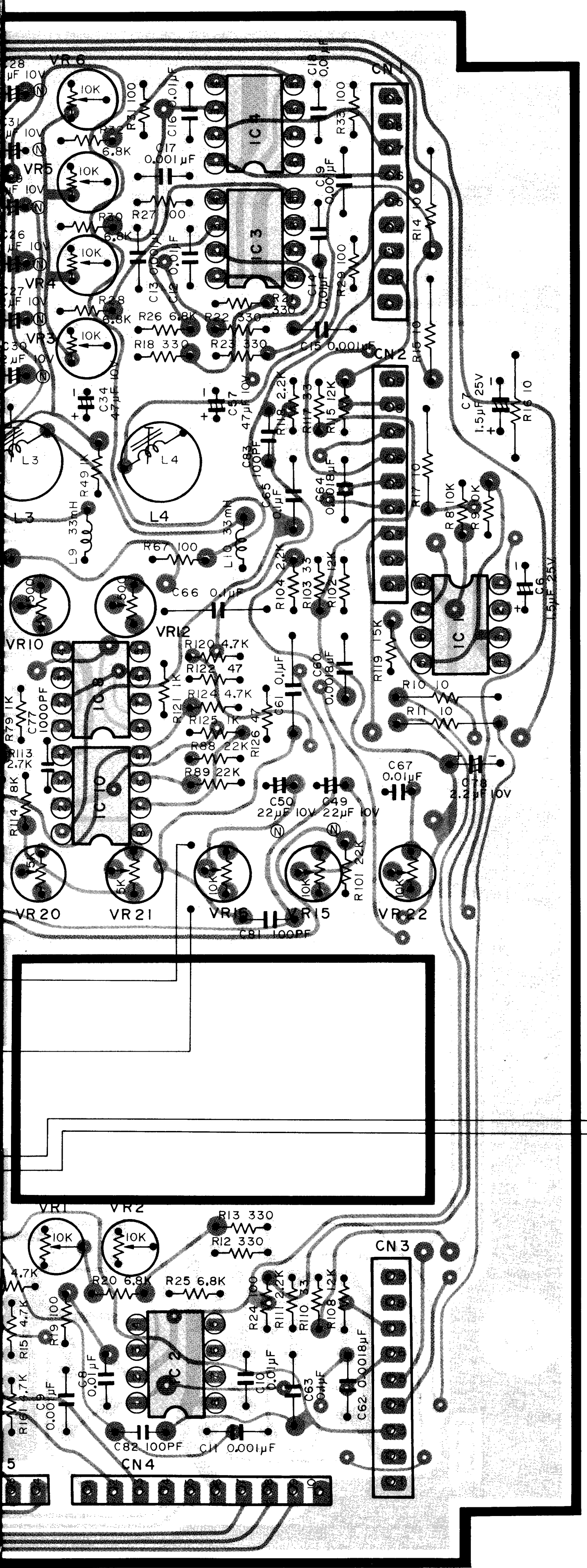
2

L3
R H-SIZE

VR10
R H-LIN2

L4
B H-SIZE

VR12
B H-LIN2


VR6
VR5
VR4
VR3
10K
R31 100
C16 0.01μF
C17 0.001μF
6.8K
R30 R27 100
C13 0.01μF
C12 0.01μF
R28 6.8K
R26 6.8K
R22 330
R21 330
R18 330
R23 330
IC4
IC3
C18 0.01μF
R33 100
C19 0.001μF
C14 0.01μF
R29 100
C15 0.001μF
R14 10
R15 10
CN1
CN2
C34 47μF 10V
C57 47μF 10V
L3
L4
R49 1K
L9 33mH
L10 33mH
R67 100
C83 100PF
C65 0.1μF
C64 0.0018μF
R118 2.2K
R117 33
R115 12K
C7 1.5μF 25V
R16 10
R17 10
R8 10K
R9 10K
R104 2.2K
R103 33
R102 12K
C66 0.1μF
C6 1.5μF 25V
IC
VR10
VR12
R120 4.7K
R122 47
R121 1K
R124 4.7K
R125 1K
R126 47
R88 22K
R89 22K
C61 0.1μF
C60 0.0018μF
R119 15K
R10 10
R11 10
R79 1K
C77 1000PF
R113 2.7K
R114 18K
IC8
IC10
C50 22μF 10V
C49 22μF 10V
C67 0.01μF
C78 2.2μF 10V
R101 22K
VR20
VR21
VR16
VR15
VR22
5K
10K
C81 100PF
VR1
VR2
R13 330
R12 330
4.7K
R20 6.8K
R25 6.8K
R19 100
R15 4.7K
R16 4.7K
C9 0.001μF
C8 0.01μF
IC2
C10 0.01μF
C63 0.01μF
C62 0.0018μF
R24 100
R111 2.2K
R110 33
R108 12K
C82 100PF
C11 0.001μF
CN3
5
CN4

CN1

9	B H-ALIGNMENT OUT
8	B H-ALIGNMENT OUT
7	B V-ALIGNMENT OUT
6	B V-ALIGNMENT OUT
5	B H-DEFLECTION OUT
4	B H-DEFLECTION OUT
3	B V-DEFLECTION OUT
2	B V-DEFLECTION OUT
1	GND

CN2

9	G H-ALIGNMENT OUT
8	G H-ALIGNMENT OUT
7	G V-ALIGNMENT OUT
6	G V-ALIGNMENT OUT
5	G H-DEFLECTION OUT
4	G H-DEFLECTION OUT
3	G V-DEFLECTION OUT
2	G V-DEFLECTION OUT
1	GND

VR14
TOTAL V-LIN

VR17
R V-LIN

VR18
B V-LIN

VR19
TOTAL V-SIZE

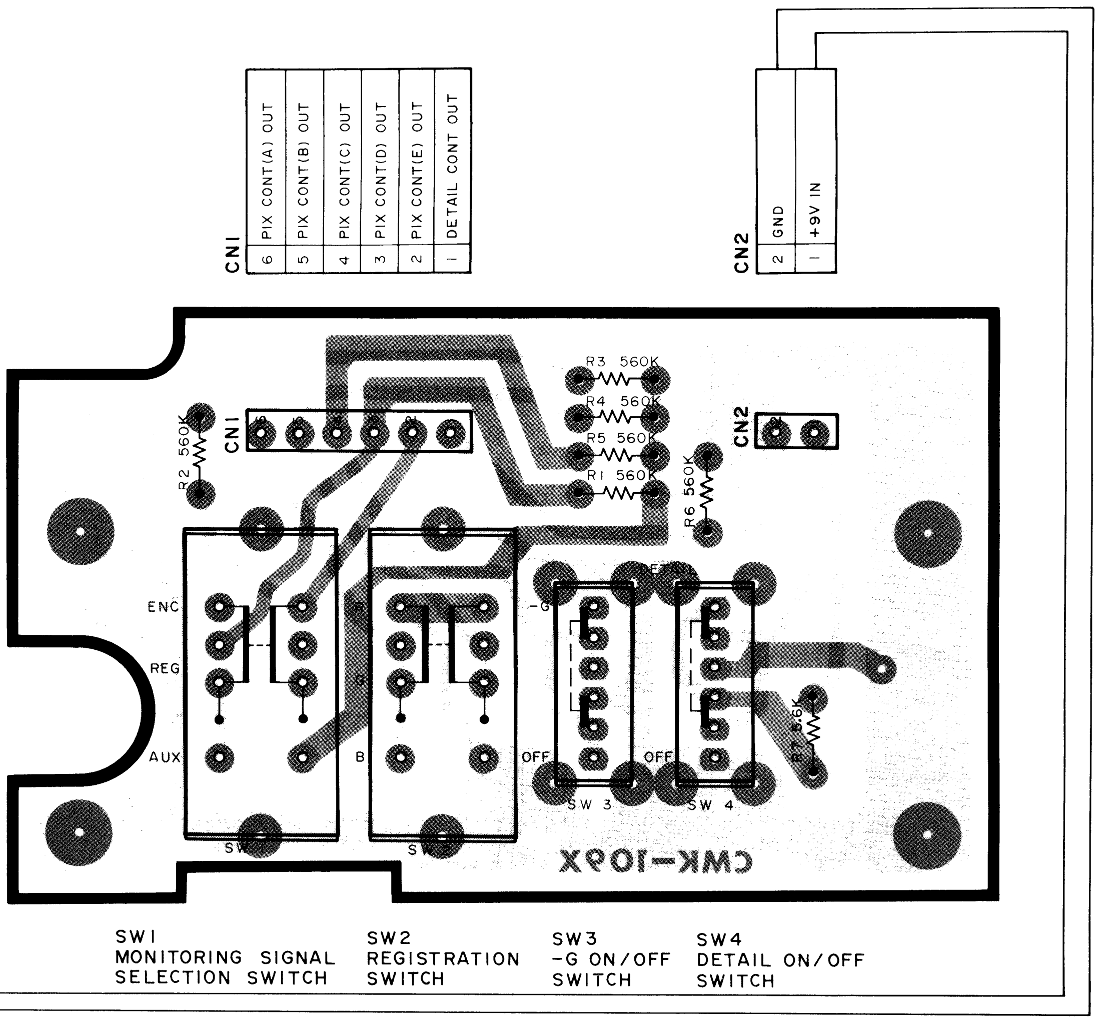
VR20
R V-SIZE

VR21
B V-SIZE

VR16
R SKEW

VR15
B SKEW

VR22
G V-CENTERING


CN1
R2 560K
R3 560K
R4 560K
R5 560K
R1 560K
R6 560K
R7 5.6K
CN2
ENC
REG
AUX
R
G
B
-G
DETAIL
OFF
OFF
SW 1
SW 2
SW 3
SW 4
CWK-109X

CN1

6	PIX CONT(A) OUT
5	PIX CONT(B) OUT
4	PIX CONT(C) OUT
3	PIX CONT(D) OUT
2	PIX CONT(E) OUT
1	DETAIL CONT OUT

CN2

2	GND
1	+9V IN

SW1
MONITORING SIGNAL
SELECTION SWITCH

SW2
REGISTRATION
SWITCH

SW3
-G ON/OFF
SWITCH

SW4
DETAIL ON/OFF
SWITCH

CN3

9	R H-ALIGNMENT OUT
8	R H-ALIGNMENT OUT
7	R V-ALIGNMENT OUT
6	R V-ALIGNMENT OUT
5	R H-DEFLECTION OUT
4	R H-DEFLECTION OUT
3	R V-DEFLECTION OUT
2	R V-DEFLECTION OUT
1	GND

5

3	4
RCU R H-CENT IN	RCU R V-CENT IN

CN 4

1	2	3	4	5	6	7	8	9	10
B SHADING OUT	R SHADING OUT	G SHADING OUT	HD IN	Vs IN	+9V IN	RCU-CAMERA CONT IN	+12V IN	H/V DETECT OUT	GND

VR42
R H-CENTERING

VR40
R V-CENTERING

VR1
R V-ALIGNMENT

VR41
B H-CENTERING

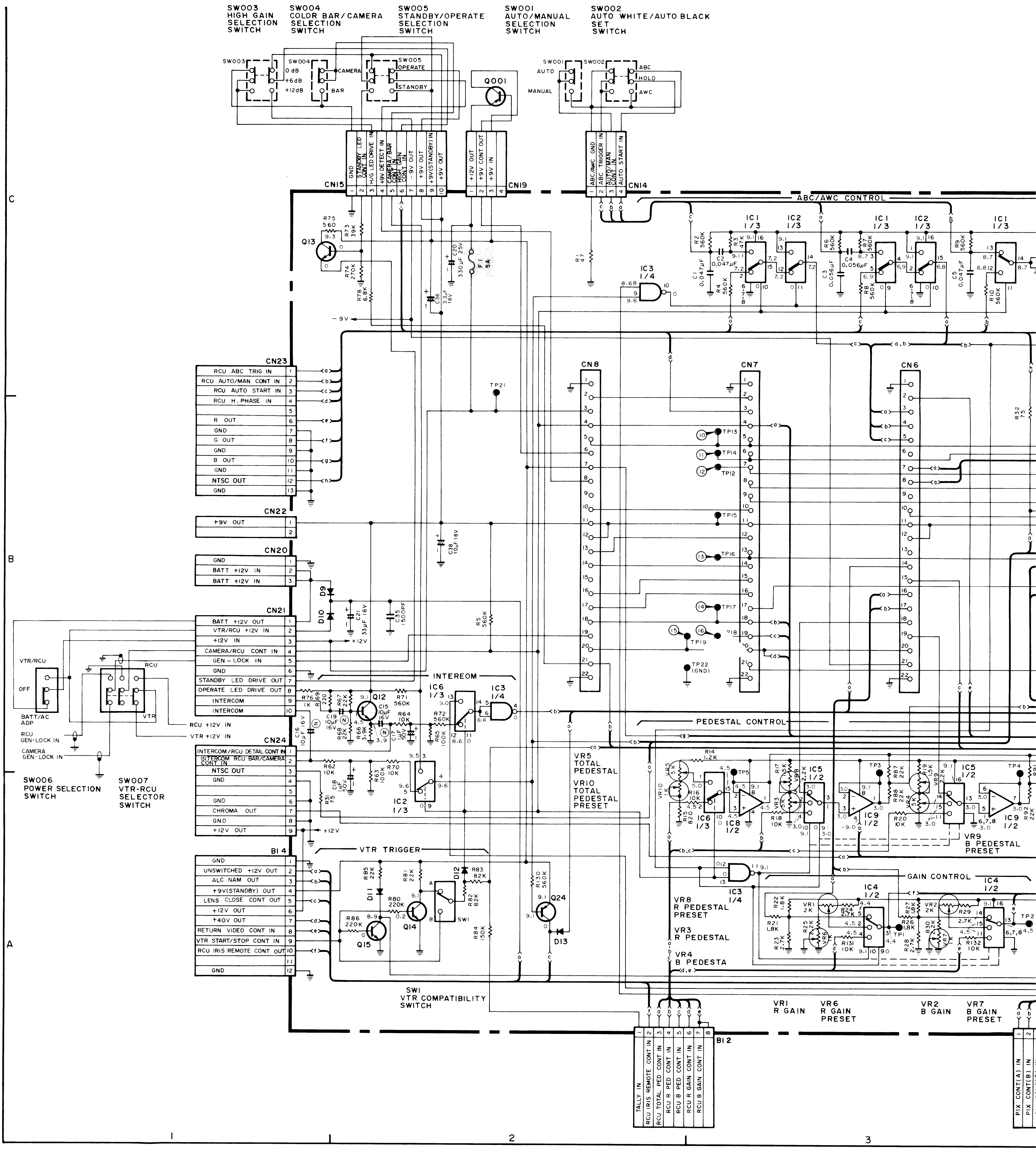
VR39
B V-CENTERING

VR2
R H-ALIGNMENT

3

Q12	2SB641-RS	C2	Q20	2SD636-RS	B1	D1	MA165	C1
Q13	2SD636-RS	C2	Q21	2SD636-RS	A2	D2	MA165	C1
Q14	2SB641-RS	C2	Q22	2SD636-RS	A2	D3	MA165	B1, C1
Q15	2SB641-RS	B1	Q23	2SD636-RS	A2	D4	MA165	C1
Q16	2SD636-RS	B1	Q24	2SD636-RS	A2	D5	MA165	C2
Q17	2SB641-RS	B1	Q25	2SD636-RS	A2	D6	MA165	C2
Q18	2SB641-RS	B1	Q26	2SD636-RS	A2	D7	MA165	C2
Q19	2SD636-RS	B1	Q27	2SD636-RS	A2	D8	MA165	C2
						D9	MA165	C2
						D10	MA165	C2

SCHEMATIC DIAGRAM


SW003 HIGH GAIN SELECTION SWITCH
SW004 COLOR BAR/CAMERA SELECTION SWITCH
SW005 STANDBY/OPERATE SELECTION SWITCH
SW001 AUTO/MANUAL SELECTION SWITCH
SW002 AUTO WHITE/AUTO BLACK SET SWITCH
0 dB
+6dB
+12dB
CAMERA
BAR
OPERATE
STANDBY
AUTO
MANUAL
ABC
HOLD
AWC
Q001
CN15
GND
STANDBY LED CONT IN
H/G LED DRIVE IN
+9V DETECT IN
CAMERA/BAR CONT IN
HIGH GAIN CONT IN
-9V OUT
+9V(STANDBY) IN
+9V OUT
CN19
+12V OUT
+9V CONT OUT
+9V IN
CN14
ABC/AWC GND
ABC TRIGGER IN
AUTO/MAN CONT IN
AUTO START IN
ABC/AWC CONTROL
IC1 1/3
IC2 1/3
IC3 1/4
Q13
R75 560
R73 39K
R74 270K
R78 6.8K
C20 330μF 25V
F1 5A
C36 3.3μF 16V
-9V
R1 47
R2 560K
R3 47K
C1 0.047μF
C2 0.047μF
R4 560K
R6 560K
C3 0.056μF
C4 0.056μF
R7 560K
R8 560K
R9 560K
C5 0.047μF
R10 560K
CN23
RCU ABC TRIG IN
RCU AUTO/MAN CONT IN
RCU AUTO START IN
RCU H. PHASE IN
R OUT
GND
G OUT
B OUT
NTSC OUT
CN22
+9V OUT
CN20
BATT +12V IN
CN21
BATT +12V OUT
VTR/RCU +12V IN
+12V IN
CAMERA/RCU CONT IN
GEN-LOCK IN
STANDBY LED DRIVE OUT
OPERATE LED DRIVE OUT
INTERCOM
CN24
INTERCOM/RCU DETAIL CONT IN
INTERCOM RCU BAR/CAMERA CONT IN
NTSC OUT
CHROMA OUT
+12V OUT
B14
UNSWITCHED +12V OUT
ALC NAM OUT
+9V(STANDBY) OUT
LENS CLOSE CONT OUT
+40V OUT
RETURN VIDEO CONT IN
VTR START/STOP CONT IN
RCU IRIS REMOTE CONT OUT
TP21
C38 10μF 16V
D9
D10
C21 33μF 16V
C35 1500PF
R5 560K
+12V
VTR/RCU
OFF
RCU
VTR
BATT/AC ADP
RCU GEN-LOCK IN
CAMERA GEN-LOCK IN
RCU +12V IN
VTR +12V IN
SW006 POWER SELECTION SWITCH
SW007 VTR-RCU SELECTOR SWITCH
INTERCOM
IC6 1/3
IC3 1/4
Q12
R71 560K
R72 560K
R64 10K
C15 10μF 16V
C19 10μF 16V
C16 10μF 16V
C17 1μF 50V
R62 10K
R70 10K
R63 100K
C18 1μF 50V
R31 75
IC2 1/3
VTR TRIGGER
R85 22K
R81 22K
R83 82K
R82 82K
R80 220K
R86 220K
R84 150K
D11
D12
Q14
Q15
SW1
SW1 VTR COMPATIBILITY SWITCH
R130 560K
Q24
D13
CN8
CN7
CN6
TP13
TP14
TP12
TP15
TP16
TP17
TP19
TP22 (GND)
R32 75
PEDESTAL CONTROL
VR5 TOTAL PEDESTAL
VR10 TOTAL PEDESTAL PRESET
R14 1.2K
TP5
IC6 1/3
IC8 1/2
IC5 1/2
TP3
IC9 1/2
TP4
VR9 B PEDESTAL PRESET
R18 10K
R20 10K
IC3 1/4
VR8 R PEDESTAL PRESET
VR3 R PEDESTAL
VR4 B PEDESTA
GAIN CONTROL
IC4 1/2
R22 1.8K
R21 1.8K
R23 2.7K
R26 1.8K
R131 10K
R132 10K
TP1
TP2
VR1 R GAIN
VR6 R GAIN PRESET
VR2 B GAIN
VR7 B GAIN PRESET
B12
TALLY IN
RCU IRIS REMOTE CONT IN
RCU TOTAL PED CONT IN
RCU R PED CONT IN
RCU B PED CONT IN
RCU R GAIN CONT IN
RCU B GAIN CONT IN
PIX CONT(A) IN
PIX CONT(B) IN
A
B
C
1
2
3

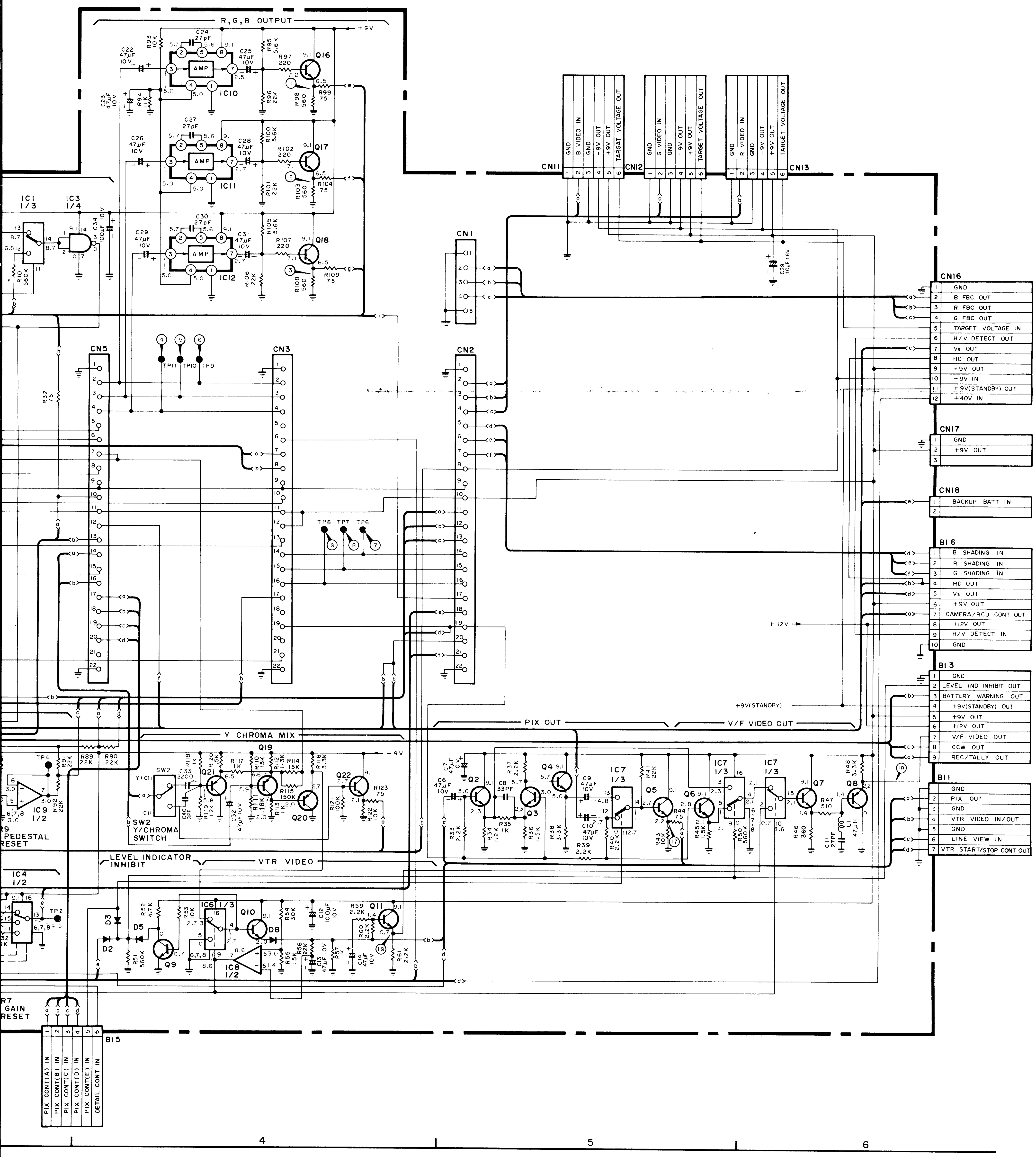
IC 1	YFHD14053BP	C2, C3
IC 2	YFHD14053BP	C2, C3
IC 3	MN4011B	A2, B1, C2, C3
IC 4	YWHD14052BP	A2, A3
IC 5	YWHD14052BP	A2, A3
IC 6	YFHD14053BP	A2, A3, B1
IC 7	YFHD14053BP	A4, A5

IC8	YHSNJM4558D	A2, A3
IC9	YHSNJM4558D	A2, A3
IC10	EHMS111H40SA	C3
IC11	EHMS111H40SA	C3
IC12	EHMS111H40SA	C3

Q2	2SD636-RS	A4
Q3	2SD636-RS	A4
Q4	2SD636-RS	A4
Q5	2SD638-QR	A4
Q6	2SC2377-CD	A5
Q7	2SC2377-CD	A5
Q8	2SA1254-BC	A5
Q9	2SD636-RS	A3
Q10	2SD638-QR	A3

Q11	2SC2377-CD	A4
Q12	2SD636-RS	B1
Q13	2SD661-TU	C1
Q14	2SD636-RS	A1
Q15	2SD636-RS	A1
Q16	2SD661-TU	C4
Q17	2SD661-TU	C4
Q18	2SD661-TU	C4

RAM OF MOTHER BOARD



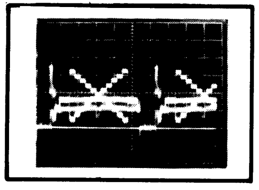
R, G, B OUTPUT
+9V
AMP
IC10
IC11
IC12
Q16
Q17
Q18
IC1 1/3
IC3 1/4
CN11
GND
B VIDEO IN
GND
-9V OUT
+9V OUT
TARGAT VOLTAGE OUT
CN12
GND
G VIDEO IN
GND
-9V OUT
+9V OUT
TARGET VOLTAGE OUT
CN13
GND
R VIDEO IN
GND
-9V OUT
+9V OUT
TARGET VOLTAGE OUT
CN1
CN5
CN3
CN2
TP11
TP10
TP9
TP8
TP7
TP6
CN16
GND
B FBC OUT
R FBC OUT
G FBC OUT
TARGET VOLTAGE IN
H/V DETECT OUT
Vs OUT
HD OUT
+9V OUT
-9V IN
+9V(STANDBY) OUT
+40V IN
CN17
GND
+9V OUT
CN18
BACKUP BATT IN
B16
B SHADING IN
R SHADING IN
G SHADING IN
HD OUT
Vs OUT
+9V OUT
CAMERA/RCU CONT OUT
+12V OUT
H/V DETECT IN
GND
+12V
B13
GND
LEVEL IND INHIBIT OUT
BATTERY WARNING OUT
+9V(STANDBY) OUT
+9V OUT
+12V OUT
V/F VIDEO OUT
CCW OUT
REC/TALLY OUT
+9V(STANDBY)
PIX OUT
V/F VIDEO OUT
Y CHROMA MIX
Q19
Q20
Q21
Q22
SW2
Y+CH
CH
SW2 Y/CHROMA SWITCH
TP4
IC9 1/2
PEDESTAL RESET
LEVEL INDICATOR INHIBIT
VTR VIDEO
IC4 1/2
TP2
IC6 1/3
Q9
Q10
Q11
D2
D3
D5
D8
IC8 1/2
Q2
Q3
Q4
IC7 1/3
Q5
Q6
Q7
Q8
B11
GND
PIX OUT
GND
VTR VIDEO IN/OUT
GND
LINE VIEW IN
VTR START/STOP CONT OUT
GAIN RESET
B15
PIX CONT(A) IN
PIX CONT(B) IN
PIX CONT(C) IN
PIX CONT(D) IN
PIX CONT(E) IN
DETAIL CONT IN
4
5
6

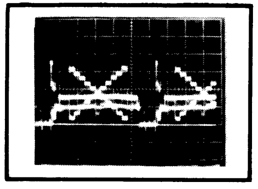
D	A4	Q19	2SB641-RS	A3	D2	MA165	A3	D11	MA165	A1
	B1	Q20	2SB641-RS	A3	D3	MA165	A3	D12	MA165	A1
	C1	Q21	2SB641-RS	A3	D5	MA165	A3	D13	MA165	A1
	A1	Q22	2SD636-RS	A4	D8	MA165	A3			
	A1	Q24	2SB641-RS	A1	D9	YUDRM-1Z	B1			
	C4				D10	YUDRM-1Z	B1			
	C4									
	C4									

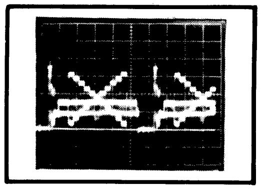
PRODUCT SAFETY NOTE

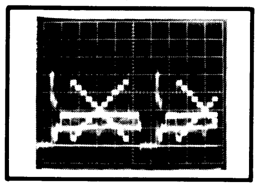
The shaded area on this schematic diagram incorporates special features important for protection from X-Radiation, fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

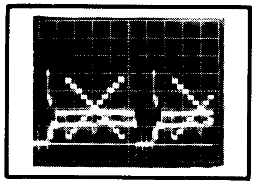
SIGNAL WAVEFORMS OF MOTHER BOARD

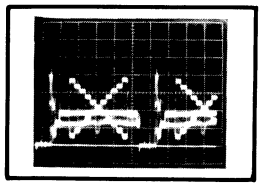
1 0.5V/DIV, 10μs/DIV


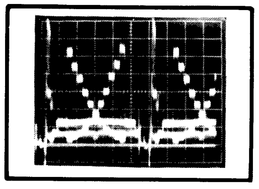
2 0.5V/DIV, 10μs/DIV


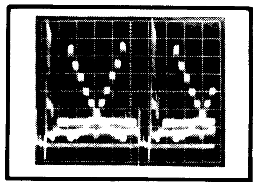
3 0.5V/DIV, 10μs/DIV


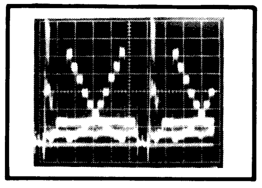
4 0.2V/DIV, 10μs/DIV,


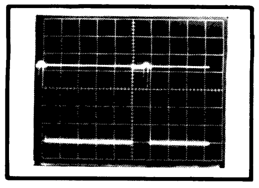
5 0.2V/DIV, 10μs/DIV


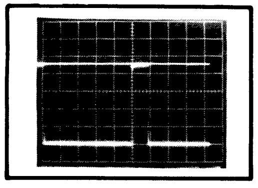
6 0.2V/DIV, 10μs/DIV


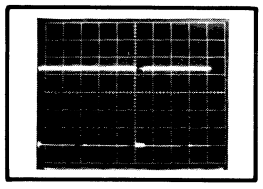
7 0.2V/DIV, 10μs/DIV


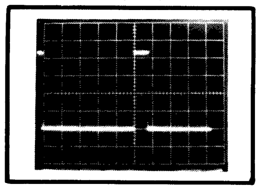
8 0.2V/DIV, 10μs/DIV


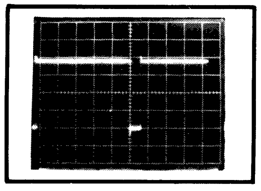
9 0.2V/DIV, 10μs/DIV


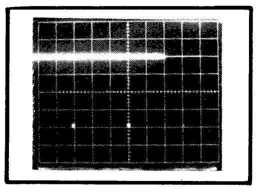
10 2V/DIV, 10μs/DIV


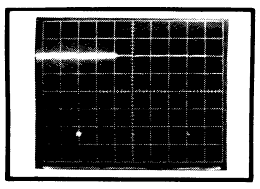
11 2V/DIV, 10μs/DIV


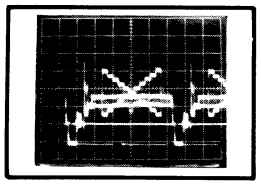
12 2V/DIV, 10μs/DIV


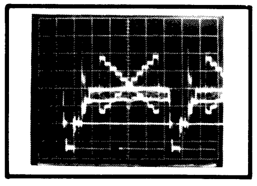
13 2V/DIV, 10μs/DIV


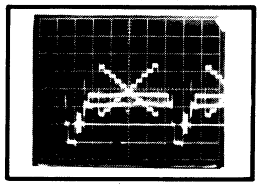
14 2V/DIV, 10μs/DIV


15 2V/DIV, 5ms/DIV


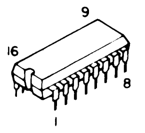
16 2V/DIV, 5ms/DIV


17 0.5V/DIV, 10μs/DIV


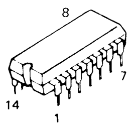
18 0.2V/DIV, 10μs/DIV


19 0.2V/DIV, 10μs/DIV


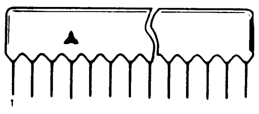
YWHD14052BP
YFHD14053BP



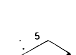
YFHD14011BP
MN4011B



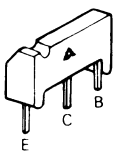
EHMS111H40SA



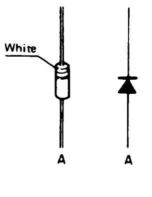
YHSNJM4558D



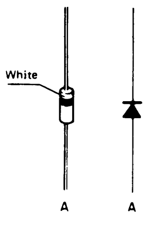
2SA1254-BC
2SB641-RS
2SC2377-CD
2SD636-RS
2SD638-QR
2SD661-TU



MA165



YUDRM-1Z



CONDUC

CN23	
RCU ABC TRIG IN	1
RCU AUTO/MAN CONT IN	2
RCU AUTO START IN	3
RCU H. PHASE IN	4
	5
R OUT	6
GND	7
G OUT	8
GND	9
B OUT	10
GND	11
NTSC OUT	12
GND	13

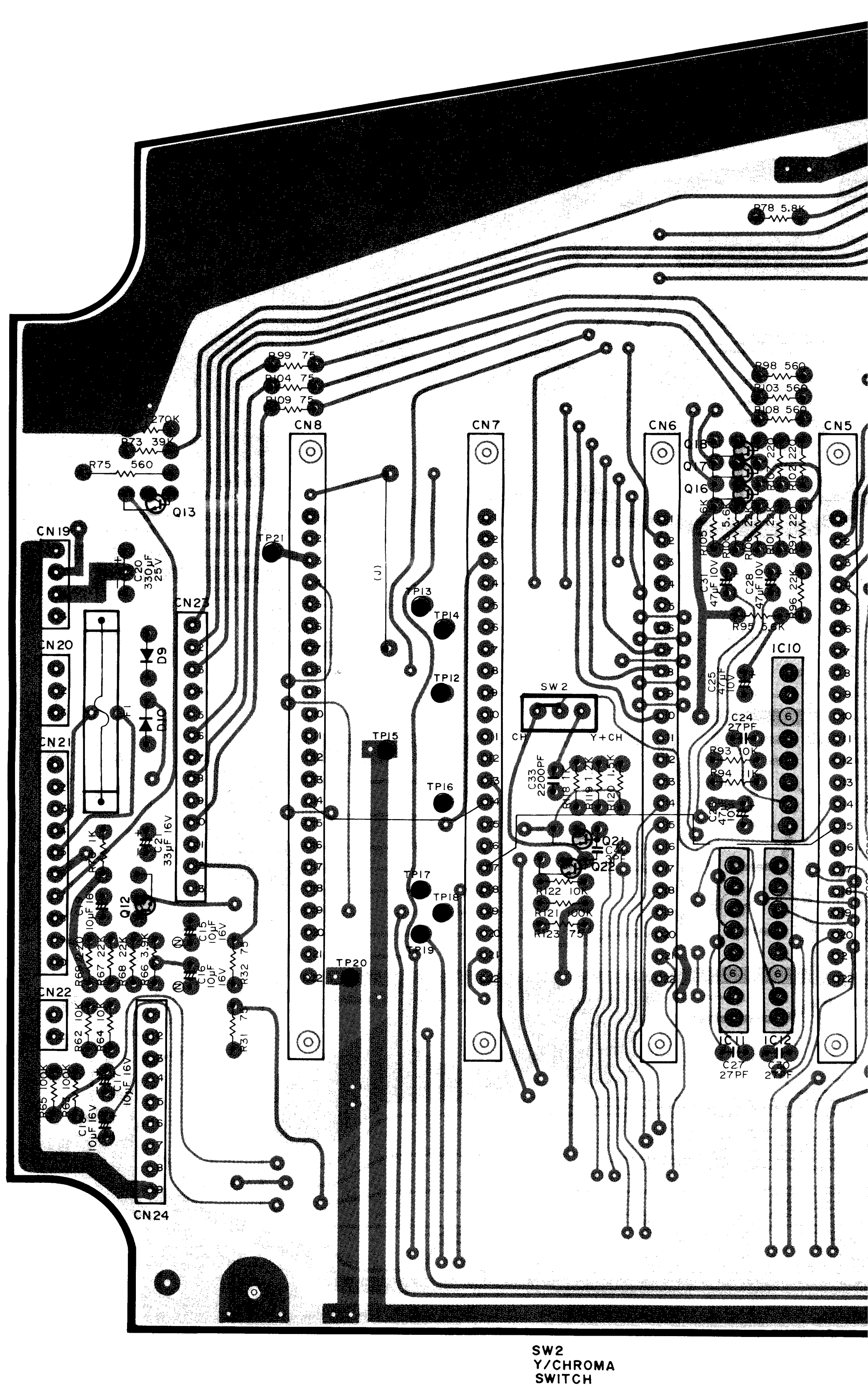
CN 19	
+12V OUT	1
+9V CONT OUT	2
+9V IN	3
	4

CN20	
GND	1
BATT +12V IN	2
BATT +12V IN	3

CN 21	
BATT +12V OUT	1
VTR/RCU +12V IN	2
+12V IN	3
CAMERA/RCU CONT IN	4
GEN-LOCK IN	5
GND	6
STANDBY LED DRIVE OUT	7
OPERATE LED DRIVE OUT	8
INTERCOM	9
INTERCOM	10

CN 22	
+9V OUT	1
	2

CN 24	
INTERCOM / RCU DETAIL CONT IN	1
INTERCOM RCU BAR/ CAMERA CONT IN	2
NTSC OUT	3
GND	4
	5
GND	6
CHROMA OUT	7
GND	8
+12V OUT	9

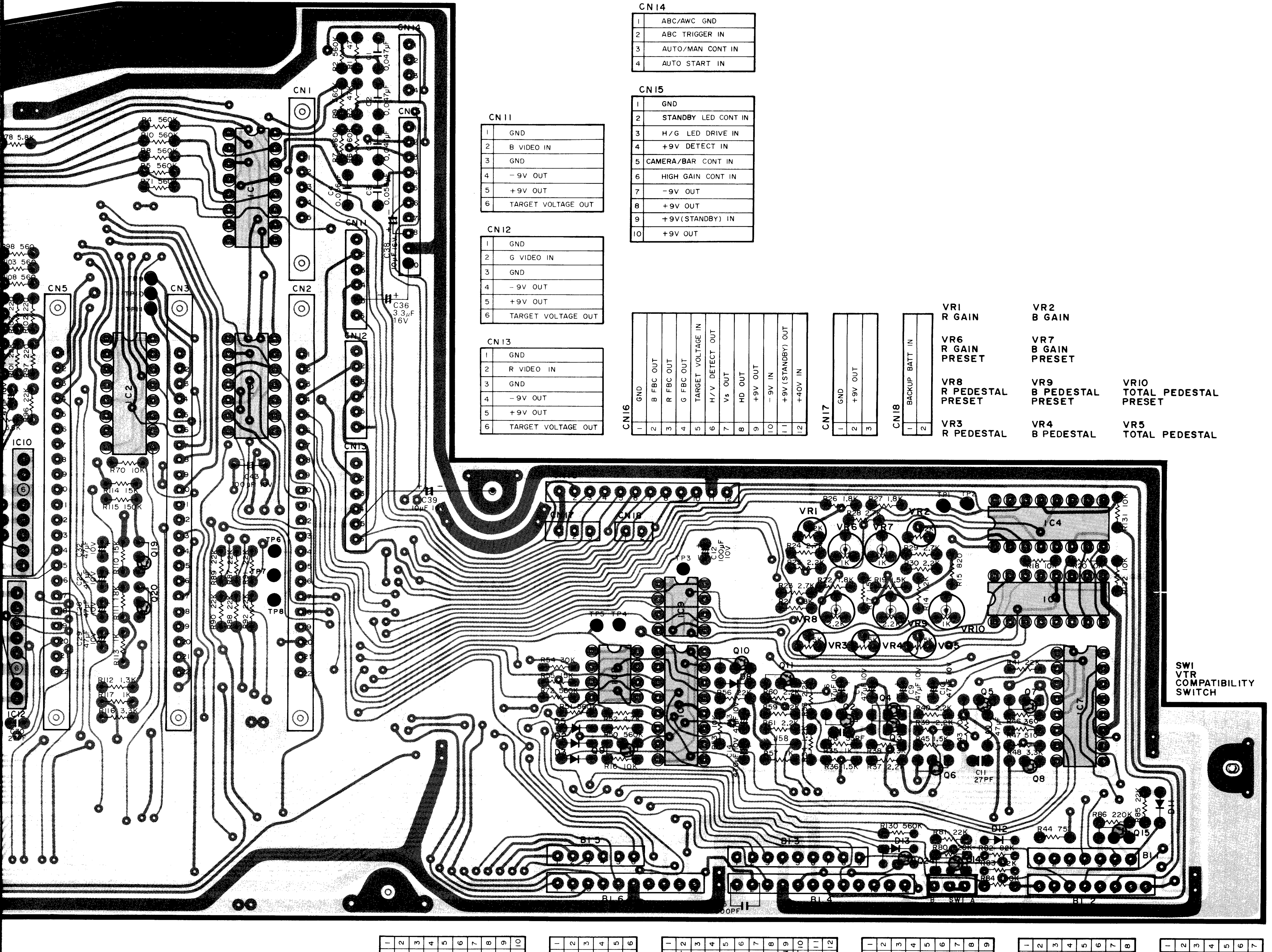

D
C
B
A
1
2
3
CN19
CN20
CN21
CN22
CN23
CN24
CN8
CN7
CN6
CN5
IC10
IC11
IC12
Q12
Q13
Q16
Q17
Q18
Q21
Q22
TP12
TP13
TP14
TP15
TP16
TP17
TP18
TP19
TP20
TP21
SW2
CH
Y+CH
D9
D10
R78 5.8K
R99 75
R104 75
R109 75
R98 560
R103 560
R108 560
R73 39K
R75 560
R93 10K
R94 1K
R121 100K
R122 10K
R123 75
R31 75
R32 75
R62 10K
C20 330μF 25V
C24 27PF
C25 47μF
C27 27PF
C28 10μF
C33 2200PF
SW2
Y/CHROMA
SWITCH

IC1	YFHD14053BP	D4
IC2	YFHD14053BP	C4
IC3	MN4011B	C4
IC4	YWHD14052BP	C7, C8
IC5	YWHD14052BP	B7, B8
IC6	TFHD14053BP	B6

IC7	YFHD14053BP	B8
IC8	YHSNJM4558D	B6
IC9	YHSNJM4558D	B6
IC10	EHMS111H40SA	B3, C3
IC11	EHMS111H40SA	B3
IC12	EHMS111H40SA	B3

Q2	2SD636-RS	B7
Q3	2SD636-RS	B7
Q4	2SD636-RS	B7
Q5	2SD638-QR	B7
Q6	2SC2377-CD	B7
Q7	2SC2377-CD	B7
Q8	2SA1254-BC	B7

NDUCTOR VIEW OF MOTHER BOARD


CN1
CN2
CN3
CN5
CN11
CN12
CN13
CN14
CN15
CN16
CN17
CN18
IC1
IC2
IC3
IC4
IC7
IC9
IC10
VR1
VR2
VR3
VR4
VR5
VR6
VR7
VR8
VR9
VR10
Q10
Q11
Q5
Q6
Q8
Q15
Q19
Q20
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
B1 1
B1 2
B1 3
B1 4
B1 5
B1 6
B SW1 A
VR1
R GAIN
VR2
B GAIN
VR6
R GAIN
PRESET
VR7
B GAIN
PRESET
VR8
R PEDESTAL
PRESET
VR9
B PEDESTAL
PRESET
VR10
TOTAL PEDESTAL
PRESET
VR3
R PEDESTAL
VR4
B PEDESTAL
VR5
TOTAL PEDESTAL
SW1
VTR
COMPATIBILITY
SWITCH
4
5
6
7
8

CN14

1	ABC/AWC GND
2	ABC TRIGGER IN
3	AUTO/MAN CONT IN
4	AUTO START IN

CN15

1	GND
2	STANDBY LED CONT IN
3	H/G LED DRIVE IN
4	+9V DETECT IN
5	CAMERA/BAR CONT IN
6	HIGH GAIN CONT IN
7	−9V OUT
8	+9V OUT
9	+9V(STANDBY) IN
10	+9V OUT

CN11

1	GND
2	B VIDEO IN
3	GND
4	−9V OUT
5	+9V OUT
6	TARGET VOLTAGE OUT

CN12

1	GND
2	G VIDEO IN
3	GND
4	−9V OUT
5	+9V OUT
6	TARGET VOLTAGE OUT

CN13

1	GND
2	R VIDEO IN
3	GND
4	−9V OUT
5	+9V OUT
6	TARGET VOLTAGE OUT

CN16

1	GND
2	B FBC OUT
3	R FBC OUT
4	G FBC OUT
5	TARGET VOLTAGE IN
6	H/V DETECT OUT
7	Vs OUT
8	HD OUT
9	+9V OUT
10	−9V IN
11	+9V (STANDBY) OUT
12	+40V IN

CN17

1	GND
2	+9V OUT
3	

CN18

1	BACKUP BATT IN
2	

B1 6

1	B SHADING IN
2	R SHADING IN
3	G SHADING IN
4	HD OUT
5	Vs OUT
6	+9V OUT
7	CAMERA/RCU CONT OUT
8	+12V OUT
9	H/V DETECT IN
10	GND

B1 5

1	PIX CONT(A) IN
2	PIX CONT(B) IN
3	PIX CONT(C) IN
4	PIX CONT(D) IN
5	PIX CONT(E) IN
6	DETAIL CONT IN

B1 4

1	GND
2	UNSWITCHED +12V OUT
3	ALC NAM OUT
4	+9V(STANDBY) OUT
5	LENS CLOSE CONT OUT
6	+12V OUT
7	+40V OUT
8	RETURN VIDEO CONT IN
9	VTR START/STOP CONT IN
10	RCU IRIS REMOTE CONT OUT
11	
12	GND

B1 3

1	GND
2	LEVEL IND INHIBIT OUT
3	BATTERY WARNING OUT
4	+9V(STANDBY) OUT
5	+9V OUT
6	+12V OUT
7	V/F VIDEO OUT
8	CCW OUT
9	REC/TALLY OUT

B1 2

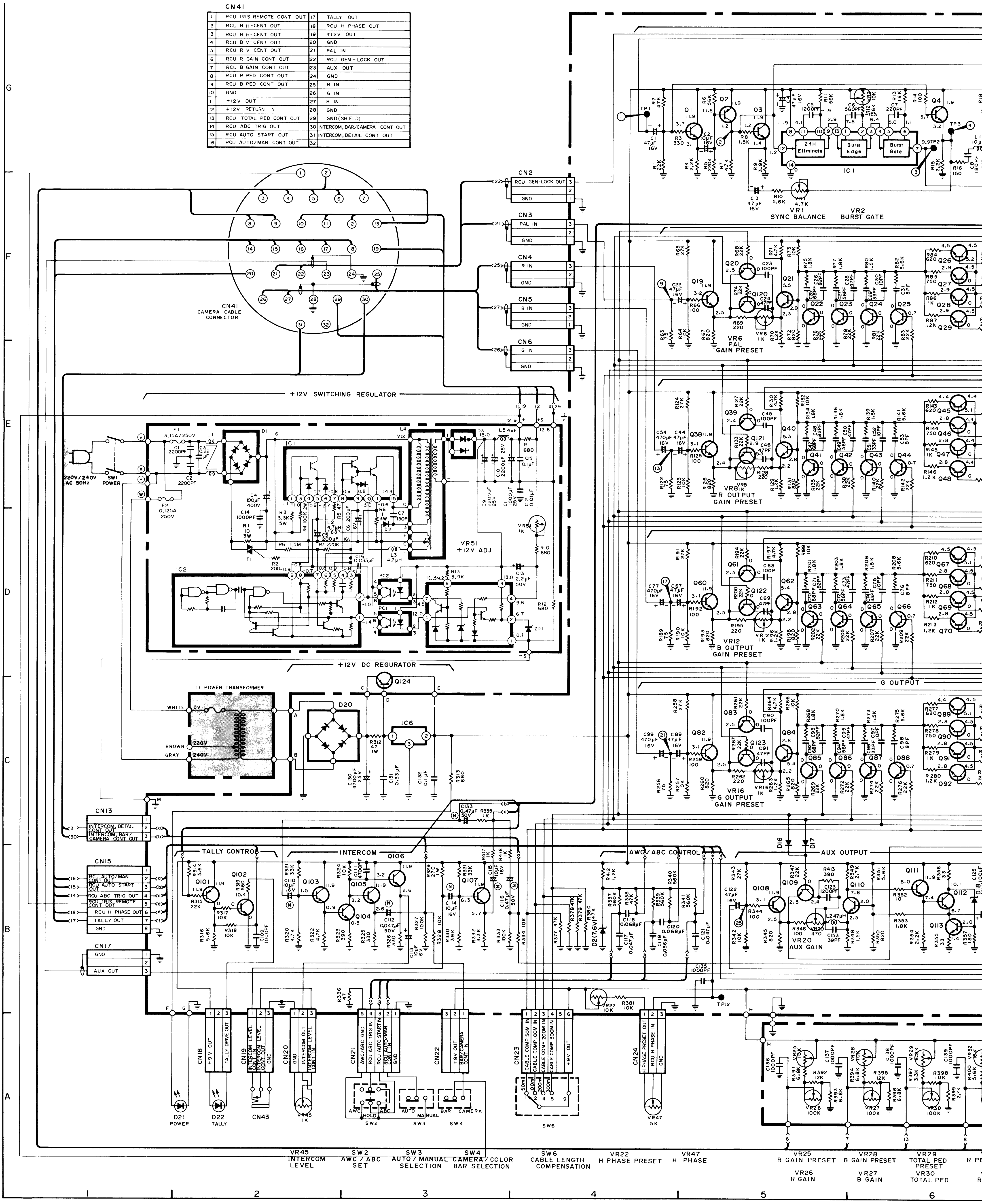
1	TALLY IN
2	RCU IRIS REMOTE CONT IN
3	RCU TOTAL PED CONT IN
4	RCU R PED CONT IN
5	RCU B PED CONT IN
6	RCU R GAIN CONT IN
7	RCU B GAIN CONT IN
8	

B1 1

1	GND
2	PIX OUT
3	GND
4	VTR VIDEO IN/OUT
5	GND
6	LINE VIEW IN
7	VTR START/STOP CONT OUT

B7	Q9	2SD636-RS	B6	Q17	2SD661-TU	C3	D2	MA165	B6
B7	Q10	2SD638-QR	B6	Q18	2SD661-TU	C3	D3	MA165	B6
B7	Q11	2SC2377-CD	B6	Q19	2SB641-RS	B4, C4	D5	MA165	B6
B7	Q12	2SD636-RS	B1	Q20	2SB641-RS	B4	D8	MA165	B6
B7	Q13	2SD661-TU	C1	Q21	2SB641-RS	B3	D9	YUDRM-1Z	C1
B7	Q14	2SD636-RS	A7	Q22	2SD636-RS	B3	D10	YUDRM-1Z	C1
B7	Q15	2SD636-RS	A8, B8	Q24	2SB641-RS	A7	D11	MA165	B8
	Q16	2SD661-TU	C3				D12	MA165	A7, B7
							D13	MA165	A7

SCHEMATIC DIAGRAM OF REMO


+12V SWITCHING REGULATOR
+12V DC REGURATOR
T1 POWER TRANSFORMER
CN41 CAMERA CABLE CONNECTOR
CN2 RCU GEN-LOCK OUT
CN3 PAL IN
CN4 R IN
CN5 B IN
CN6 G IN
CN13
CN15
CN17
220V/240V AC 50Hz
SW1 POWER
VR51 +12V ADJ
VR1 SYNC BALANCE
VR2 BURST GATE
VR6 PAL GAIN PRESET
VR8 R OUTPUT GAIN PRESET
VR12 B OUTPUT GAIN PRESET
VR16 G OUTPUT GAIN PRESET
G OUTPUT
AUX OUTPUT
VR20 AUX GAIN
TALLY CONTROL
INTERCOM
AWC/ABC CONTROL
D21 POWER
D22 TALLY
CN43
VR45 INTERCOM LEVEL
SW2 AWC / ABC SET
SW3 AUTO / MANUAL SELECTION
SW4 CAMERA / COLOR BAR SELECTION
SW6 CABLE LENGTH COMPENSATION
VR22 H PHASE PRESET
VR47 H PHASE
VR25 R GAIN PRESET
VR26 R GAIN
VR28 B GAIN PRESET
VR27 B GAIN
VR29 TOTAL PED PRESET
VR30 TOTAL PED
G
F
E
D
C
B
A
1
2
3
4
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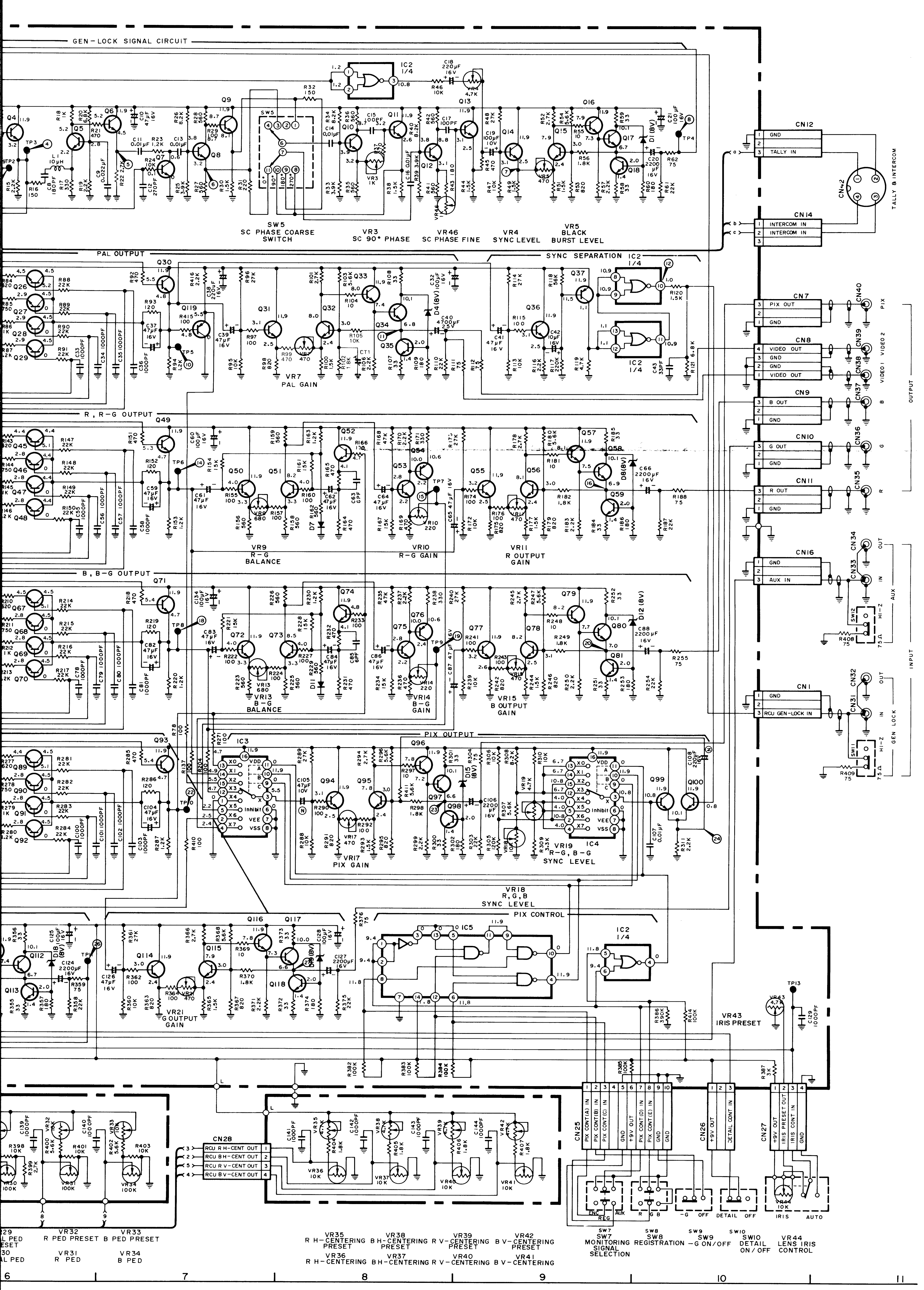
6

CN41

1	RCU IRIS REMOTE CONT OUT	17	TALLY OUT
2	RCU B H-CENT OUT	18	RCU H PHASE OUT
3	RCU R H-CENT OUT	19	+12V OUT
4	RCU B V-CENT OUT	20	GND
5	RCU R V-CENT OUT	21	PAL IN
6	RCU R GAIN CONT OUT	22	RCU GEN-LOCK OUT
7	RCU B GAIN CONT OUT	23	AUX OUT
8	RCU R PED CONT OUT	24	GND
9	RCU B PED CONT OUT	25	R IN
10	GND	26	G IN
11	+12V OUT	27	B IN
12	+12V RETURN IN	28	GND
13	RCU TOTAL PED CONT OUT	29	GND (SHIELD)
14	RCU ABC TRIG OUT	30	INTERCOM, BAR/CAMERA CONT OUT
15	RCU AUTO START OUT	31	INTERCOM, DETAIL CONT OUT
16	RCU AUTO/MAN CONT OUT	32	

REMOTE CONTROL UNIT (RCU) WV-RC30


GEN-LOCK SIGNAL CIRCUIT
SW5
SC PHASE COARSE SWITCH
VR3
SC 90° PHASE
VR46
SC PHASE FINE
VR4
SYNC LEVEL
VR5
BLACK BURST LEVEL
PAL OUTPUT
VR7
PAL GAIN
SYNC SEPARATION IC2 1/4
R, R-G OUTPUT
VR9
R-G BALANCE
VR10
R-G GAIN
VR11
R OUTPUT GAIN
B, B-G OUTPUT
VR13
B-G BALANCE
VR14
B-G GAIN
VR15
B OUTPUT GAIN
PIX OUTPUT
VR17
PIX GAIN
VR19
R-G, B-G SYNC LEVEL
VR18
R, G, B SYNC LEVEL
PIX CONTROL
VR21
G OUTPUT GAIN
VR43
IRIS PRESET
CN12
GND
TALLY IN
CN42
TALLY & INTERCOM
CN14
INTERCOM IN
CN7
PIX OUT
CN8
VIDEO OUT
CN9
B OUT
CN10
G OUT
CN11
R OUT
CN16
AUX IN
CN1
RCU GEN-LOCK IN
CN40
PIX
CN39
VIDEO 2
CN38
VIDEO 1
CN37
B
CN36
G
CN35
R
OUTPUT
CN34
OUT
CN33
IN
AUX
HI-Z
75Ω
INPUT
CN32
CN31
GEN LOCK
SW12
SW11
CN28
RCU R H-CENT OUT
RCU B H-CENT OUT
RCU R V-CENT OUT
RCU B V-CENT OUT
CN25
PIX CONT(B) IN
PIX CONT(B) IN
PIX CONT(C) IN
GND
+9V OUT
PIX CONT(D) IN
PIX CONT(E) IN
CN26
+9V OUT
DETAIL CONT IN
CN27
+9V OUT
IRIS PRESET OUT
IRIS CONT IN
GND
VR32
R PED PRESET
VR33
B PED PRESET
VR31
R PED
VR34
B PED
VR35
R H-CENTERING PRESET
VR38
B H-CENTERING PRESET
VR39
R V-CENTERING PRESET
VR42
B V-CENTERING PRESET
VR36
R H-CENTERING
VR37
B H-CENTERING
VR40
R V-CENTERING
VR41
B V-CENTERING
SW7
MONITORING SIGNAL SELECTION
ENC
REG
AUX
SW8
REGISTRATION
SW9
-G ON/OFF
SW10
DETAIL ON/OFF
VR44
LENS IRIS CONTROL
IRIS
AUTO
6
7
8
9
10
11

IC1	DN-850	G5, G6
IC2	YWHD14001BP	G8, F9, F10 B9, B10
IC3	YWHD14051BP	C7
IC4	YWHD14051BP	C9
IC5	YWHD14011BP	B8, B9
IC6	YWHA17812P	C3
Q1	2SC828-RS	G5
Q2	2SA838-BC	G5
Q3	2SC828-RS	G5
Q4	2SC828-RS	G6
Q5	2SC828-RS	G6
Q6	2SC828-RS	G7
Q7	2SC1216-F	G7
Q8	2SC828-RS	G7
Q9	2SC828-RS	G7
Q10	2SC828-RS	G8
Q11	2SC828-RS	G8
Q12	2SC828-RS	G8
Q13	2SC828-RS	G9
Q14	2SC828-RS	G9
Q15	2SC828-RS	G9
Q16	2SC828-RS	G9
Q17	2SC1317-RS	G9
Q18	2SC1317-RS	G9, G10
Q19	2SC828-RS	F5
Q20	2SC828-RS	F5
Q21	2SC828-RS	F5
Q22	2SC828-RS	F5
Q23	2SC828-RS	F5, F6
Q24	2SC828-RS	F6
Q25	2SC828-RS	F6
Q26	2SC828-RS	F6
Q27	2SC828-RS	F6
Q28	2SC828-RS	F6
Q29	2SC828-RS	F6
Q30	2SC828-RS	F7
Q31	2SC828-RS	F7, F8
Q32	2SC828-RS	F8
Q33	2SC828-RS	F8
Q34	2SC1317-RS	F8
Q35	2SC1317-RS	F8
Q36	2SC828-RS	F9
Q37	2SA838-BC	F9
Q38	2SC828-RS	E5
Q39	2SC828-RS	E5
Q40	2SC828-RS	E5
Q41	2SC828-RS	E5
Q42	2SC828-RS	E5, E6
Q43	2SC828-RS	E6
Q44	2SC828-RS	E6
Q45	2SC828-RS	E6
Q46	2SC828-RS	E6
Q47	2SC828-RS	E6
Q48	2SC828-RS	E6
Q49	2SC828-RS	E7
Q50	2SC828-RS	E7
Q51	2SC828-RS	E7, E8
Q52	2SC828-RS	E8
Q53	2SC828-RS	E8
Q54	2SA564-RS	E8
Q55	2SC828-RS	E9
Q56	2SC828-RS	E9
Q57	2SC828-RS	E9
Q58	2SC1317-RS	E9
Q59	2SC1317-RS	E9
Q60	2SC828-RS	D5
Q61	2SC828-RS	D5
Q62	2SC828-RS	D5
Q63	2SC828-RS	D5
Q64	2SC828-RS	D5, D6
Q65	2SC828-RS	D6
Q66	2SC828-RS	D6
Q67	2SC828-RS	D6
Q68	2SC828-RS	D6
Q69	2SC828-RS	D6
Q70	2SC828-RS	D6
Q71	2SC828-RS	D7
Q72	2SC828-RS	D7
Q73	2SC828-RS	D7, D8
Q74	2SC828-RS	D8
Q75	2SC828-RS	D8
Q76	2SA564-RS	D8
Q77	2SC828-RS	D9
Q78	2SC828-RS	D9
Q79	2SC828-RS	D9
Q80	2SC1317-RS	D9
Q81	2SC1317-RS	D9
Q82	2SC828-RS	C5
Q83	2SC828-RS	C5
Q84	2SC828-RS	C5
Q85	2SC828-RS	C5
Q86	2SC828-RS	C5, C6
Q87	2SC828-RS	C6
Q88	2SC828-RS	C6
Q89	2SC828-RS	C6
Q90	2SC828-RS	C6
Q91	2SC828-RS	C6
Q92	2SC828-RS	C6
Q93	2SC828-RS	C7
Q94	2SC828-RS	C8
Q95	2SC828-RS	C8
Q96	2SC828-RS	C8
Q97	2SC1317-RS	C8, C9
Q98	2SC1317-RS	C8, C9
Q99	2SC828-RS	C10
Q100	2SC828-RS	C10
Q101	2SA564-RS	B2
Q102	2SC828-RS	B2
Q103	2SC828-RS	B2
Q104	2SC828-RS	B2, B3
Q105	2SC828-RS	B3
Q106	2SC828-RS	B3
Q107	2SC828-RS	B3
Q108	2SC828-RS	B5
Q109	2SC828-RS	B5
Q110	2SC828-RS	B5, B6
Q111	2SC828-RS	B6
Q112	2SC1317-RS	B6
Q113	2SC1317-RS	B6
Q114	2SC828-RS	B7
Q115	2SC828-RS	B7
Q116	2SC828-RS	B7, B8
Q117	2SC1317-RS	C8
Q118	2SC1317-RS	C8
Q119	2SA838-BC	F7
Q120	2SC828-RS	F5
Q121	2SC828-RS	E5
Q122	2SC828-RS	D5
Q123	2SC828-RS	C5
D1	YUDXZ-080	G10
D2	XZ076	B4
D4	YUDXZ-080	F8
D7	MA150	E8
D8	YUDXZ-080	E9, E10
D11	MA150	D8
D12	YUDXZ-080	D9, D10
D15	YUDXZ-080	C9
D16	MA165	B5, C5
D17	MA165	B5, C5
D18	YUDXZ-080	B6
D19	YUDXZ-080	B8
D20	YWM4C51-13	C2, C3

RCU (SWITCHING REGULATOR BOARD)

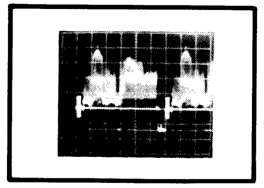
IC1	STK-711P	F7
IC2	STK-752	F7
IC3	STK-761D	F8
PC1	PC714U	F7, F8
PC2	PC714U	F7, F8
T1	TA10E-R	F8
D1	DBA20G	E8, F8
D2	ERC25-08	F7
D3	S5KC20	D7, E7
ZD1	GZA618Y	F8

PRODUCT SAFETY NOTE

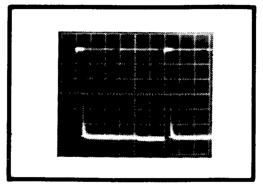
The shaded area on this schematic diagram incorporates special features important for protection from X-Radiation, fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

SIGNAL WAVEFORMS OF REMOTE CONTROL UNIT

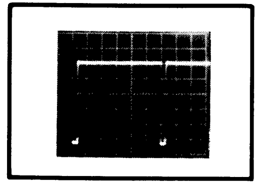
1 0.2V/DIV, 10µs/DIV



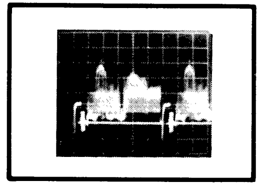
2 2V/DIV, 10µs/DIV



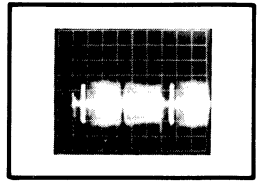
3 2V/DIV, 10µs/DIV



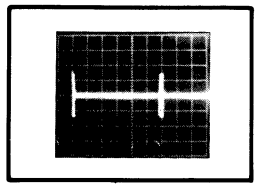
4 0.2V/DIV, 10µs/DIV



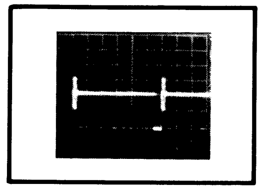
5 0.5V/DIV, 10µs/DIV



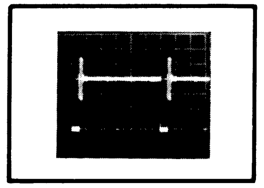
6 0.2V/DIV, 10µs/



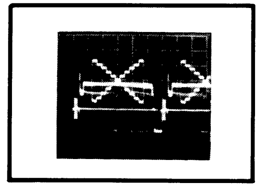
7 0.2V/DIV, 10µs/DIV



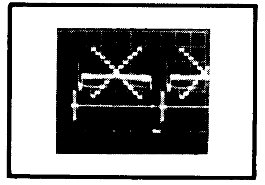
8 0.1V/DIV, 10µs/DIV



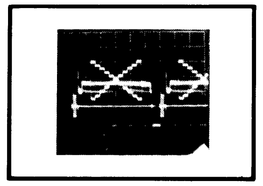
9 0.2V/DIV,10µs/DIV



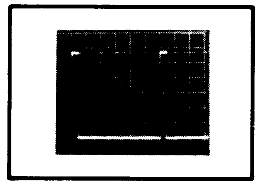
10 0.2V/DIV, 10µs/DIV



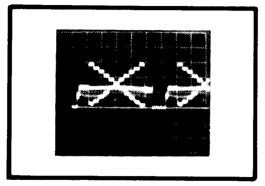
11 0.5V/DIV, 10µs/DIV



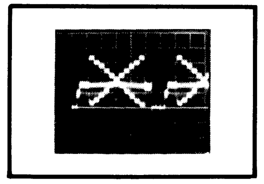
12 2V/DIV, 10µs/DIV



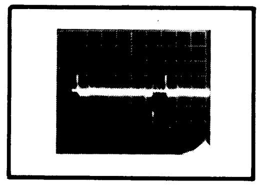
13 0.2V/DIV, 10µs/DIV



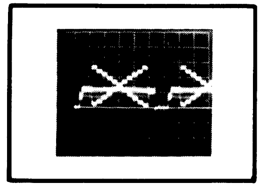
14 0.2V/DIV, 10µs/DIV



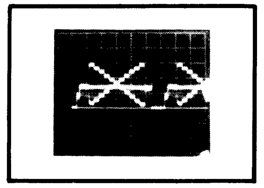
15 0.2V/DIV, 10µs/DIV



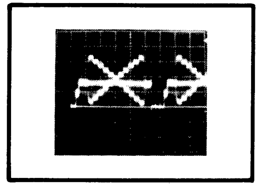
16 0.5V/DIV, 10µs/DIV



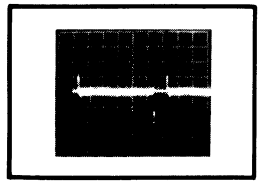
17 0.2V/DIV, 10µs/DIV



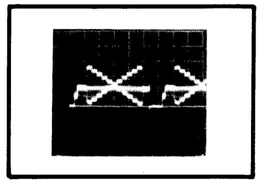
18 0.2V/DIV, 10µs/DIV



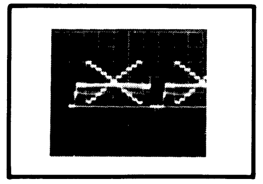
19 0.2V/DIV, 10µs/DIV



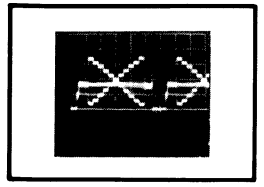
20 0.5V/DIV, 10µs/DIV



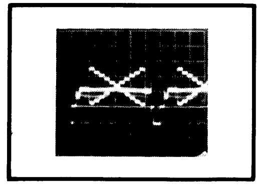
21 0.2V/DIV, 10µs/DIV



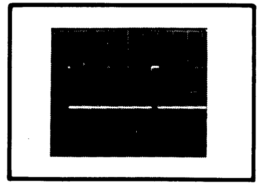
22 0.2V/DIV, 10µs/DIV



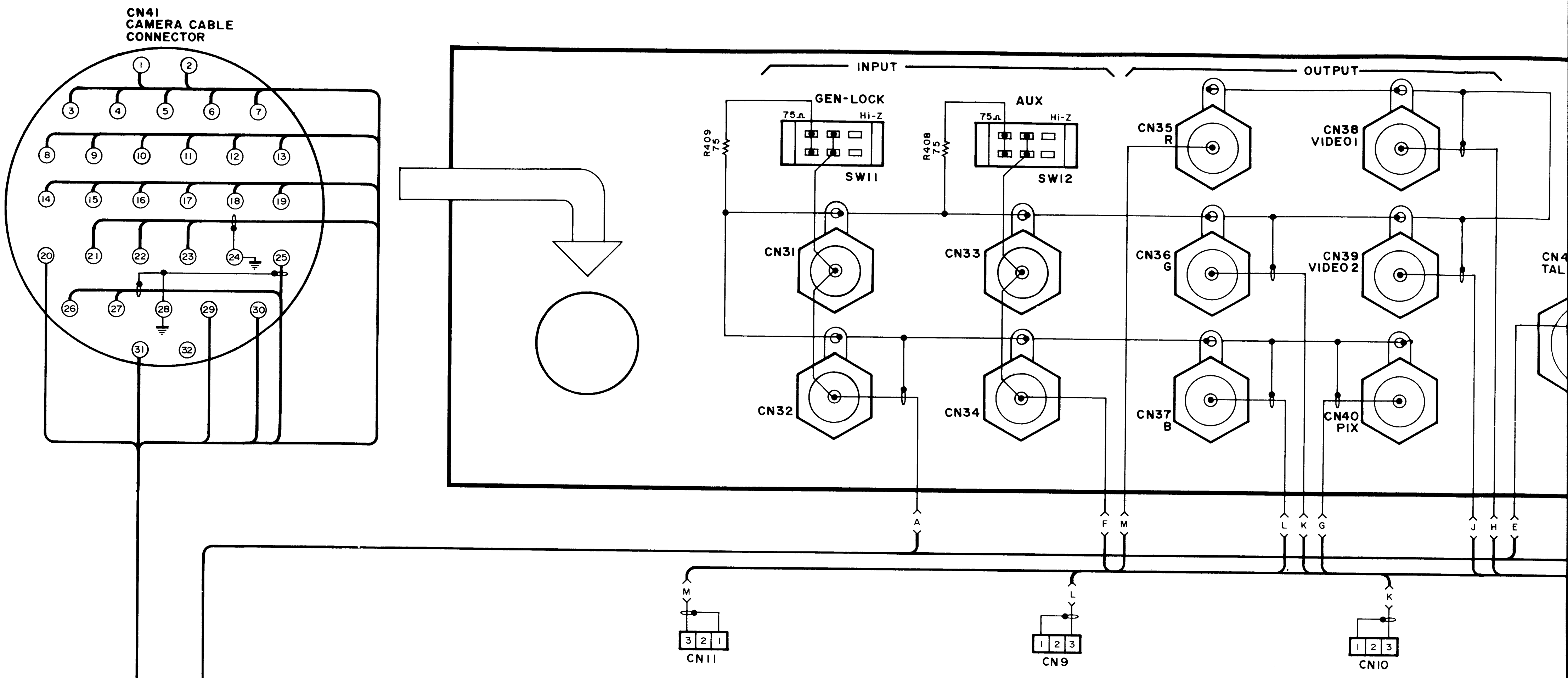
23 0.5V/DIV, 10µs/DIV



24 1V/DIV, 10µs/DIV



CONDUCTOR VIEW OF REMOTE


CN41
CAMERA CABLE
CONNECTOR
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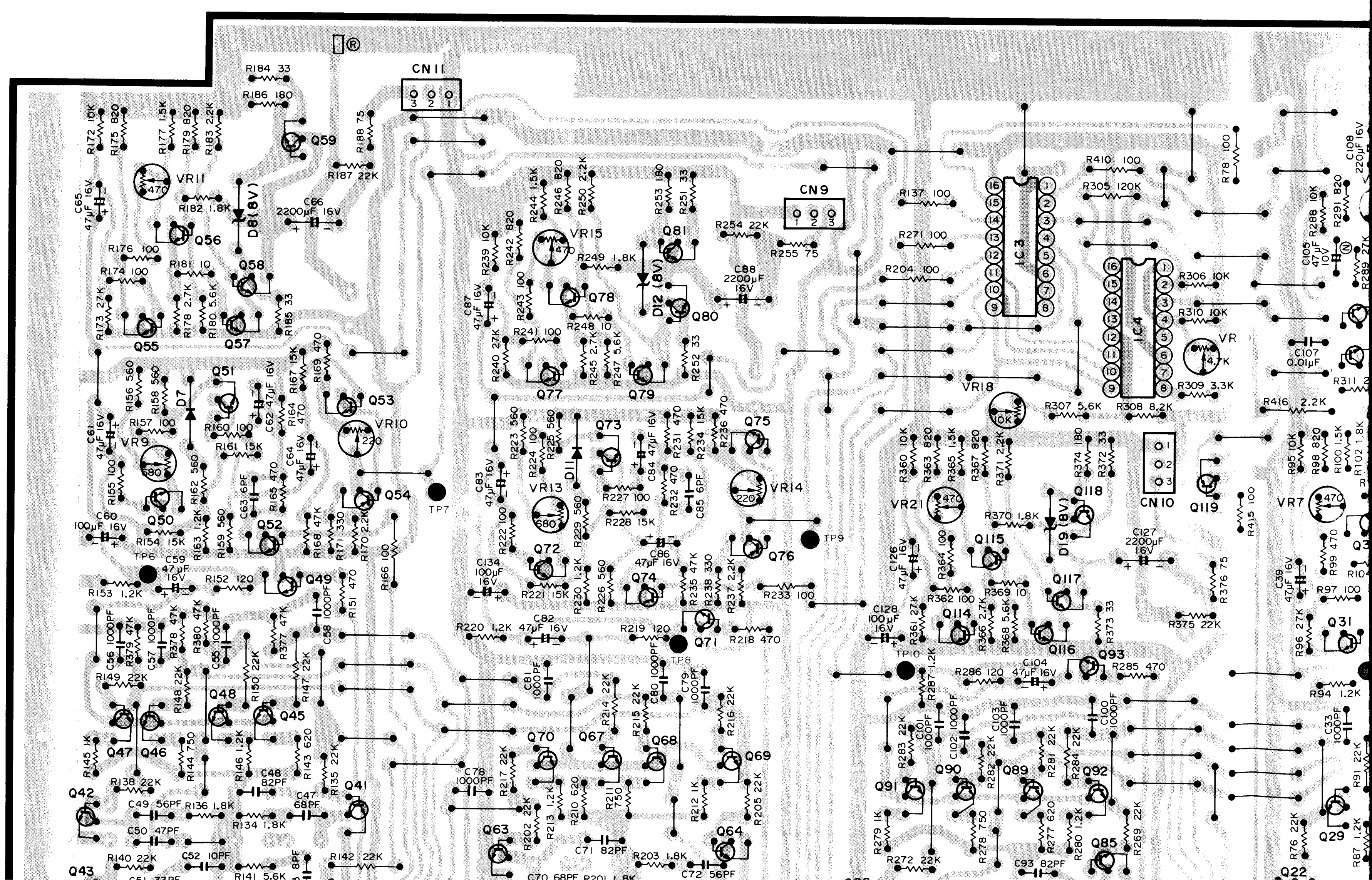
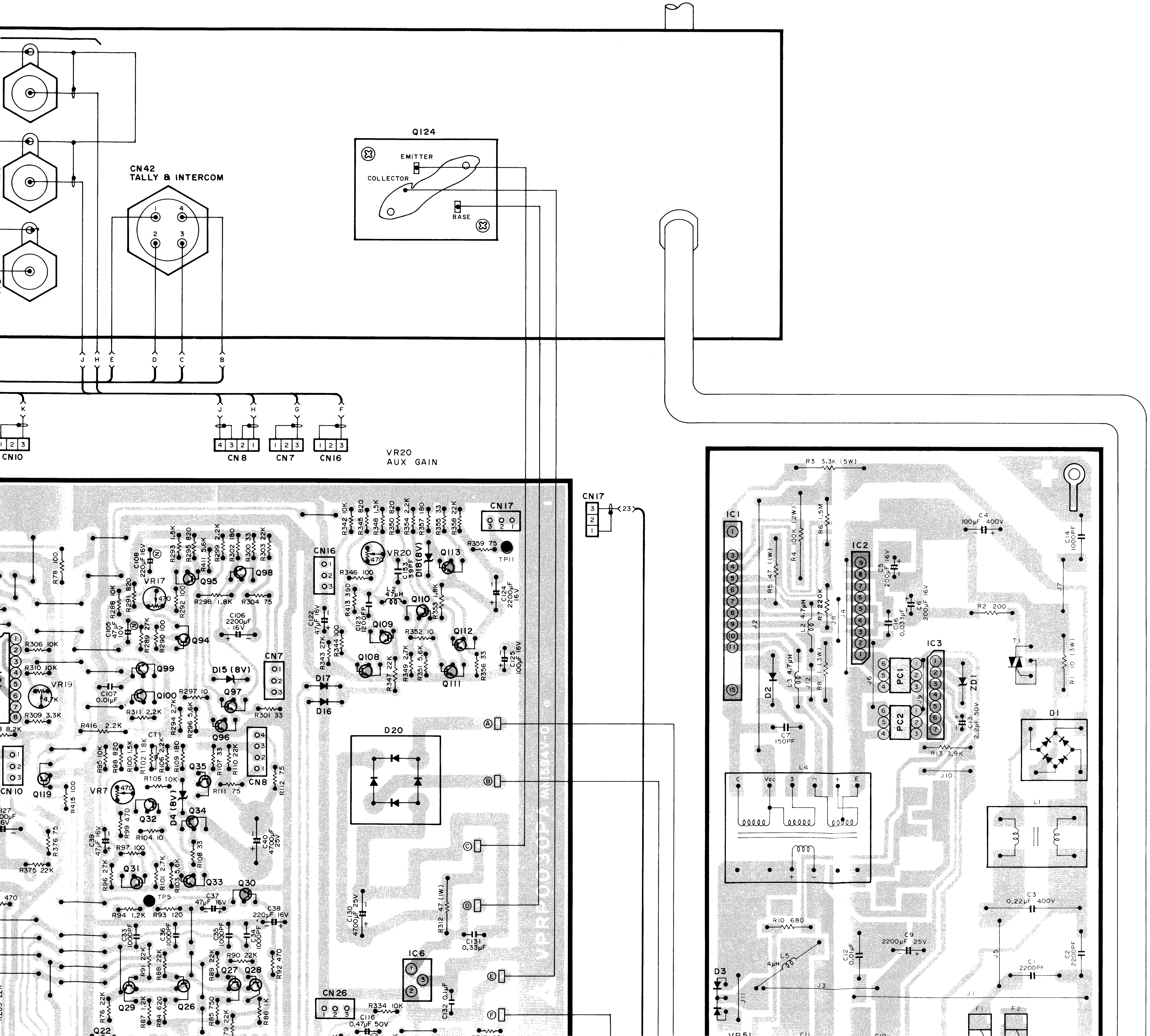
31
32
INPUT
OUTPUT
GEN-LOCK
75Ω
Hi-Z
SW11
R409 75
AUX
75Ω
Hi-Z
SW12
R408 75
CN35
R
CN38
VIDEO1
CN31
CN33
CN36
G
CN39
VIDEO 2
CN4
TAL
CN32
CN34
CN37
B
CN40
PIX
A
F
M
L
K
G
J
H
E
M
L
K
3 2 1
CN11
1 2 3
CN9
1 2 3
CN10

VR11	R OUTPUT GAIN
VR10	R-G GAIN
VR9	R-G BALANCE
VR8	R OUTPUT GAIN PRESET
VR15	B OUTPUT GAIN
VR14	B-G GAIN
VR13	B-G BALANCE
VR12	B OUTPUT GAIN PRESET
VR43	IRIS PRESET
VR22	H PHASE PRESET
VR19	R-G, B-G SYNC LEVEL
VR18	R,G,B SYNC LEVEL
VR21	G OUTPUT GAIN
VR16	G OUTPUT GAIN PRESET
VR17	PIX GAIN
VR7	


CN11
CN9
CN10
IC3
IC4
VR11
VR10
VR9
VR15
VR13
VR14
VR18
VR21
VR7
TP6
TP7
TP8
TP9
TP10
D8(8V)
D12(8V)
D19(8V)
Q41
Q42
Q43
Q45
Q46
Q47
Q48
Q49
Q50
Q51
Q52
Q53
Q54
Q55
Q56
Q57
Q58
Q59
Q63
Q64
Q67
Q68
Q69
Q70
Q71
Q72
Q73
Q74
Q75
Q76
Q77
Q78
Q79
Q80
Q81
Q85
Q89
Q90
Q91
Q92
Q93
Q114
Q115
Q116
Q117
Q118
Q119
Q22
Q29
Q31
C66 2200µF 16V
C88 2200µF 16V
C127 2200µF 16V
C78 1000PF
C71 82PF
C72 56PF
C104 47µF 16V
C107 0.01µF
C108 220µF 16V
R184 33
R186 180
R187 22K
R188 75
R249 1.8K
R254 22K
R255 75
R137 100
R271 100
R204 100
R410 100
R305 120K
R306 10K
R310 10K
R309 3.3K
R307 5.6K
R308 8.2K
R416 2.2K
R370 1.8K
R286 120
R285 470
R233 100
R218 470
R219 120
R220 1.2K
R221 15K
R227 100
R228 15K
R152 120
R153 1.2K
R154 15K
R182 1.8K
R140 22K
R141 5.6K
R142 22K
R201 1.8K
R203 1.8K
R272 22K
R375 22K
R97 100
R94 1.2K

REMOTE CONTROL UNIT (RCU) WV-RC30



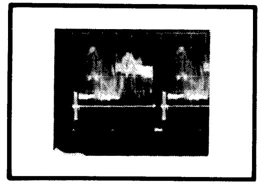
RCU (MAIN BOARD)

IC1	DN-850	C6
IC2	YWHD14001BP	C4, D4
IC3	YWHD14051BP	F4
IC4	YWHD14051BP	F4
IC5	YWHD14011BP	C4, D4
IC6	YWHA17812P	E6
Q1	2SC828-RS	D6
Q2	2SA838-BC	D6
Q3	2SC828-RS	D6
Q4	2SC828-RS	D6
Q5	2SC828-RS	C6, D6
Q6	2SC828-RS	C6
Q7	2SC1216-F	C6
Q8	2SC828-RS	C5, C6
Q9	2SC828-RS	C5
Q10	2SC828-RS	C5
Q11	2SC828-RS	C5
Q12	2SC828-RS	C5
Q13	2SC828-RS	C5
Q14	2SC828-RS	C4
Q15	2SC828-RS	C4
Q16	2SC828-RS	C4
Q17	2SC1317-RS	C4
Q18	2SC1317-RS	C4
Q19	2SC828-RS	D5
Q20	2SC828-RS	D5
Q21	2SC828-RS	D5
Q22	2SC828-RS	D5
Q23	2SC828-RS	D5
Q24	2SC828-RS	D5
Q25	2SC828-RS	D5
Q26	2SC828-RS	E5
Q27	2SC828-RS	E5
Q28	2SC828-RS	E5
Q29	2SC828-RS	E5
Q30	2SC828-RS	E5
Q31	2SC828-RS	E5
Q32	2SC828-RS	E5
Q33	2SC828-RS	E5
Q34	2SC1317-RS	E5
Q35	2SC1317-RS	E5
Q36	2SC828-RS	D5
Q37	2SA838-BC	C5, D5
Q38	2SC828-RS	D2
Q39	2SC828-RS	D2
Q40	2SC828-RS	D2
Q41	2SC828-RS	E2
Q42	2SC828-RS	E2
Q43	2SC828-RS	D2
Q44	2SC828-RS	D2
Q45	2SC828-RS	E2
Q46	2SC828-RS	E2
Q47	2SC828-RS	E2
Q48	2SC828-RS	E2
Q49	2SC828-RS	E2
Q50	2SC828-RS	E2
Q51	2SC828-RS	F2
Q52	2SC828-RS	E2
Q53	2SC828-RS	F2
Q54	2SA564-RS	E2
Q55	2SC828-RS	F2
Q56	2SC828-RS	F2
Q57	2SC828-RS	F2
Q58	2SC1317-RS	F2
Q59	2SC1317-RS	F2
Q60	2SC828-RS	D3
Q61	2SC828-RS	D3
Q62	2SC828-RS	D3
Q63	2SC828-RS	D3, E3
Q64	2SC828-RS	D3, E3
Q65	2SC828-RS	D3
Q66	2SC828-RS	D3
Q67	2SC828-RS	E3
Q68	2SC828-RS	E3

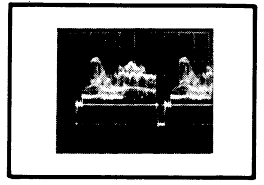
RCU (SWITCHING REGULATOR BOARD)

IC1	STK-711P	E2, E3
IC2	STK-752	D2
IC3	STK-761D	D3, D4
PC1	PC714U	D3
PC2	PC714U	D3
T1	TA10E-R	D2
D1	DBA20G	E2
D2	ERC25-08	D3
D3	S5KC20	E3
ZD1	GZA618Y	D4

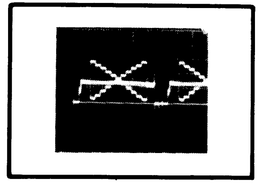
25 0.2V/DIV, 10μs/DIV



26 0.2V/DIV, 10μs/DIV

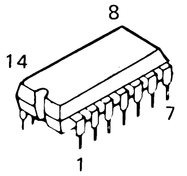


27 0.5V/DIV, 10μs/DIV

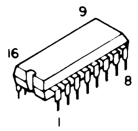


MAIN BOARD

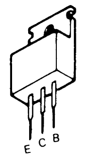
DN-850
YWHD14001BP
YWHD14011BP



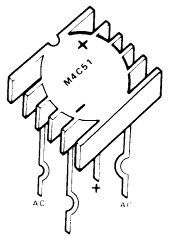
YWHD14051



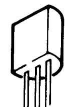
YWHA17812P



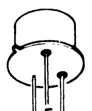
YWM4C51-13



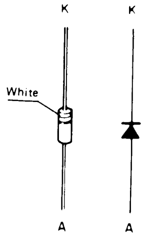
2SA564-RS
2SA838-BC
2SC828-RS
2SC1317-RS



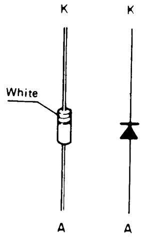
2SC1216-F



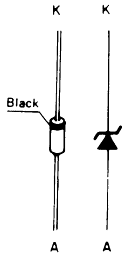
MA165



MA150

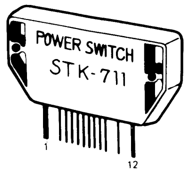


XZ076
YUDXZ-080

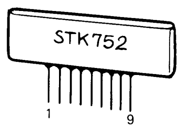


SWITCHING REGULATOR

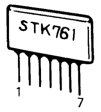
STK-711P


POWER SWITCH
STK-711
1
12

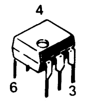
STK-752



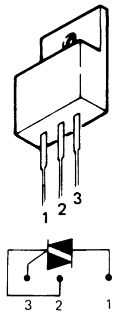
STK-761D



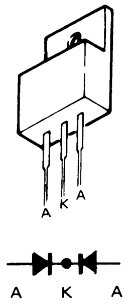
PC714U



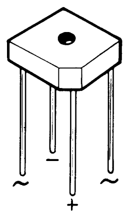
TA10E-R



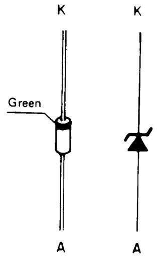
S5KC20



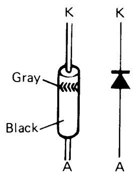
DBA20G

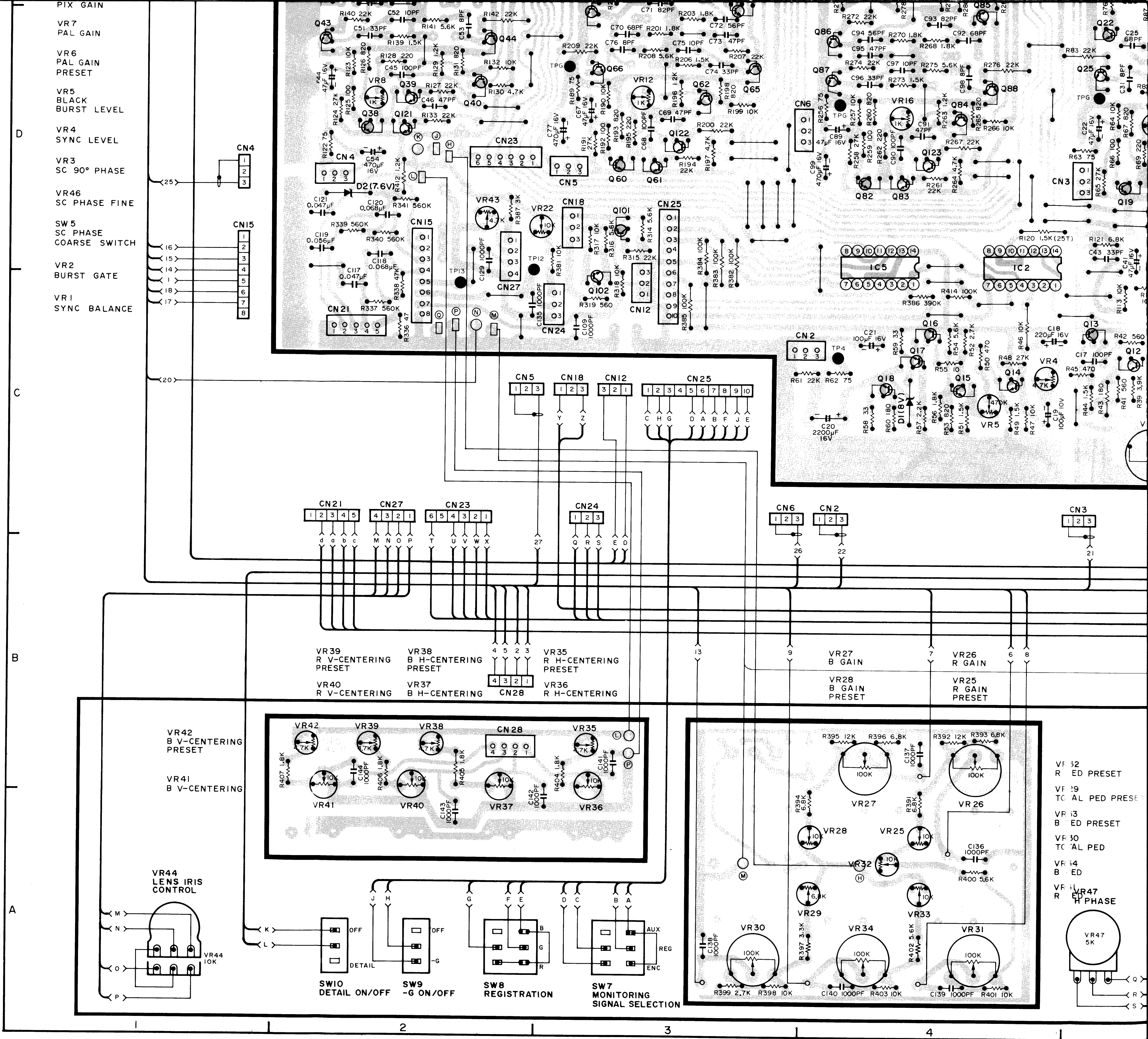


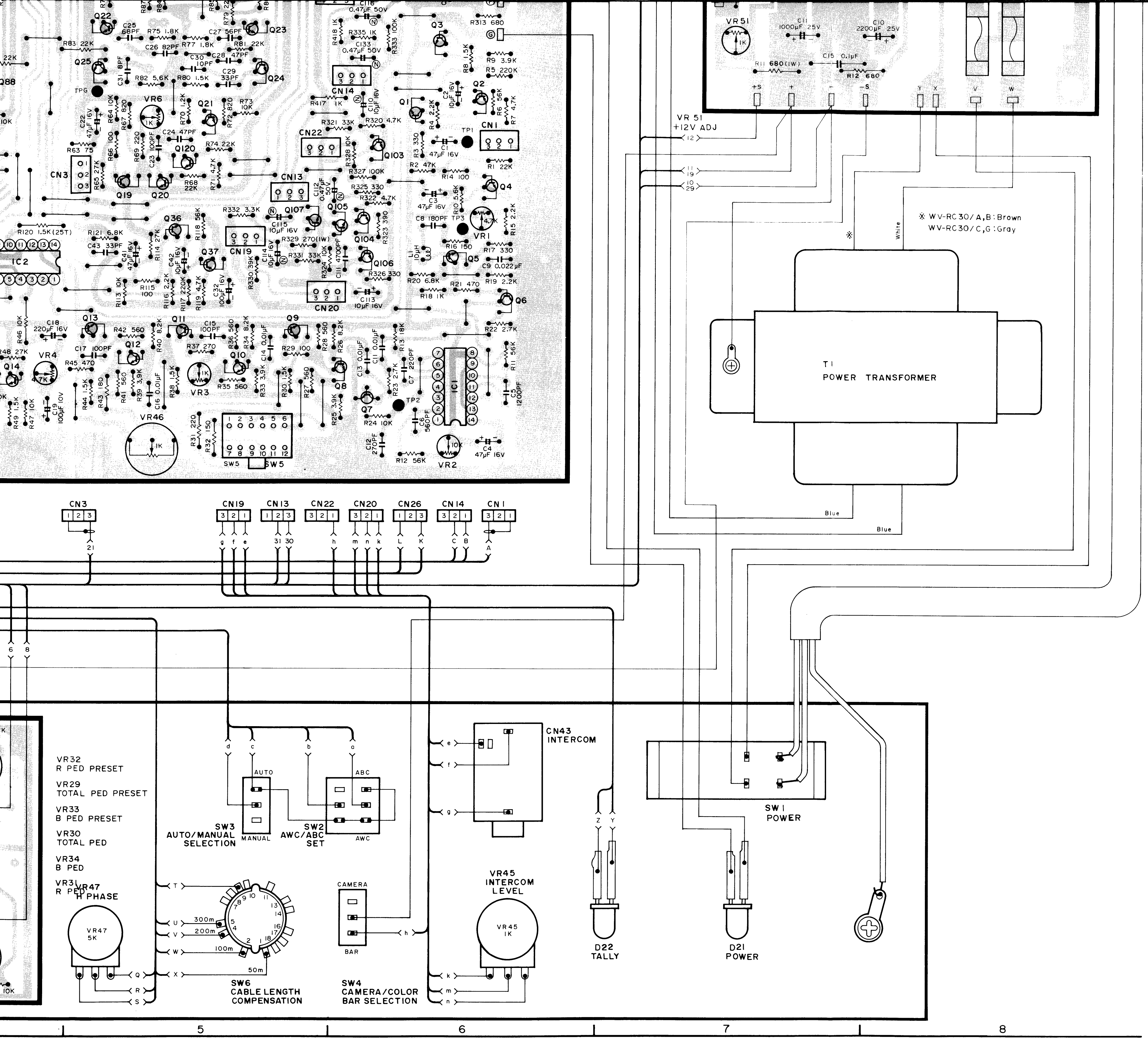
GZA618Y



ERC25-08

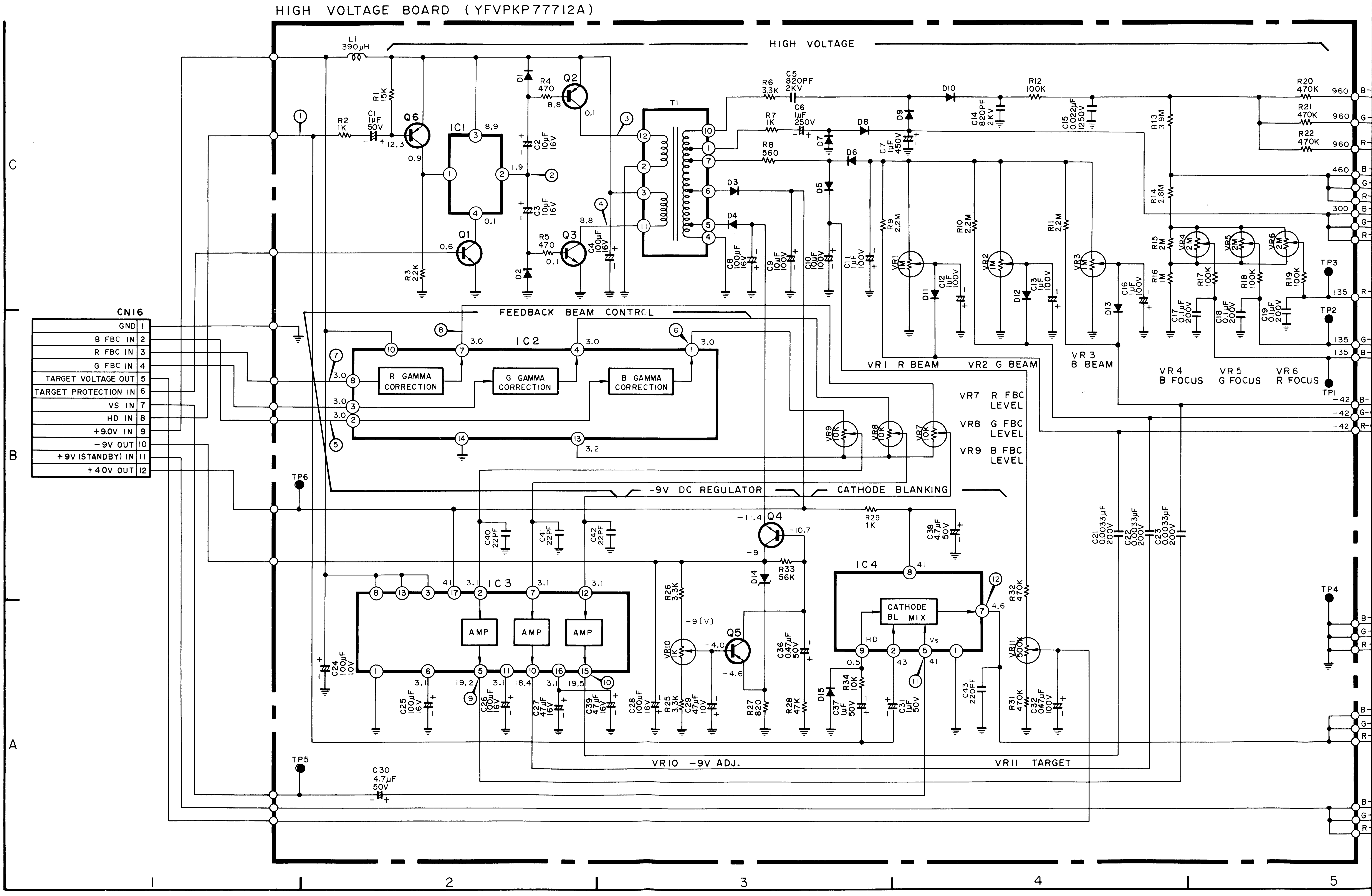

K
K
Gray
Black
A
A

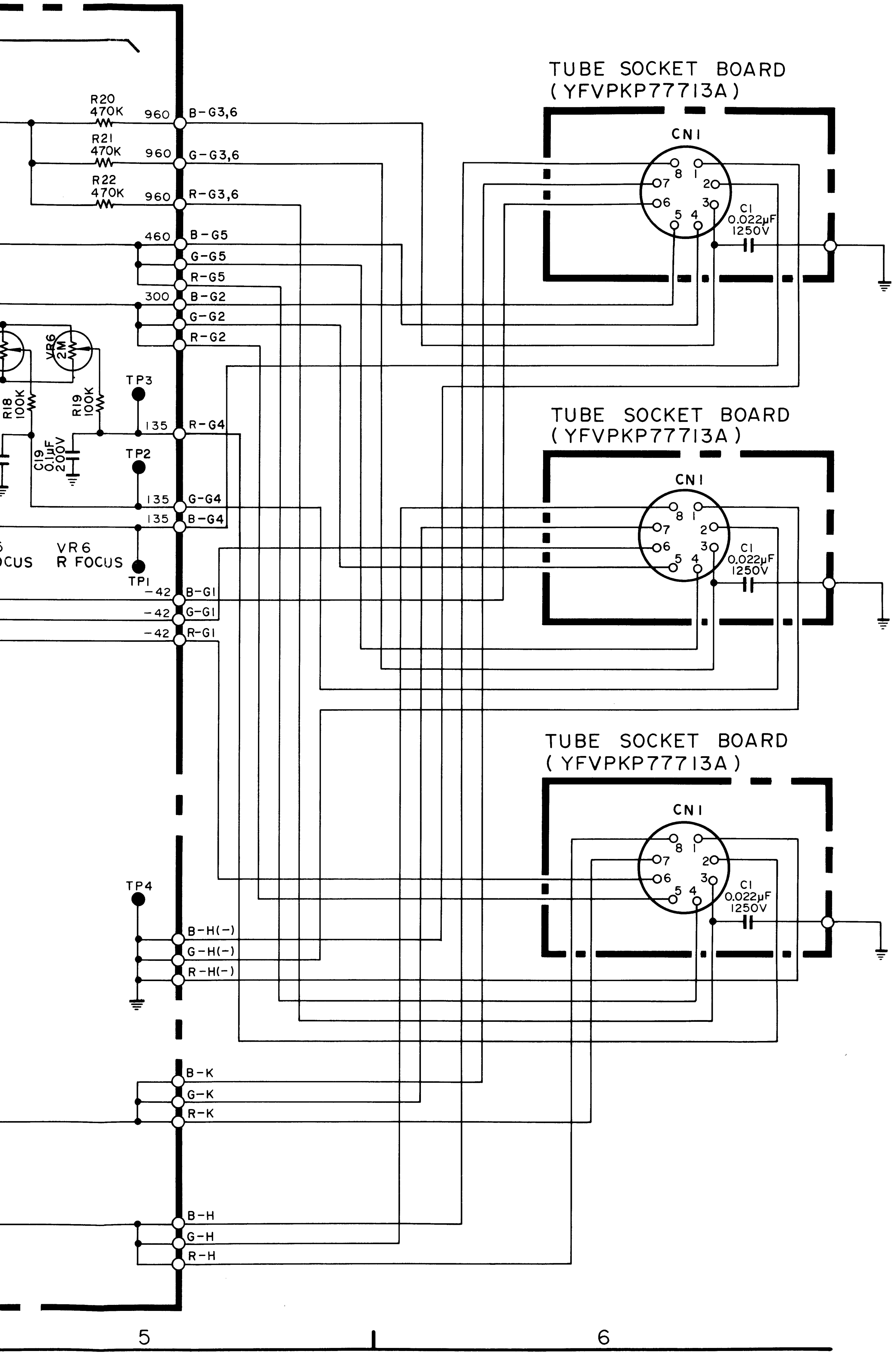

PIX GAIN
VR7
PAL GAIN
VR6
PAL GAIN
PRESET
VR5
BLACK
BURST LEVEL
VR4
SYNC LEVEL
VR3
SC 90° PHASE
VR46
SC PHASE FINE
SW5
SC PHASE
COARSE SWITCH
VR2
BURST GATE
VR1
SYNC BALANCE
D
C
B
A
CN4
CN15
CN21
CN27
CN23
CN24
CN5
CN18
CN12
CN25
CN6
CN2
CN3
CN28
IC5
IC2
VR39
R V-CENTERING
PRESET
VR40
R V-CENTERING
VR38
B H-CENTERING
PRESET
VR37
B H-CENTERING
VR35
R H-CENTERING
PRESET
VR36
R H-CENTERING
VR27
B GAIN
VR28
B GAIN
PRESET
VR26
R GAIN
VR25
R GAIN
PRESET
VR42
B V-CENTERING
PRESET
VR41
B V-CENTERING
VR44
LENS IRIS
CONTROL
SW10
DETAIL ON/OFF
SW9
-G ON/OFF
SW8
REGISTRATION
SW7
MONITORING
SIGNAL SELECTION
OFF
DETAIL
OFF
-G
B
G
R
AUX
REG
ENC
VR47
H PHASE
1
2
3
4


VR 51
+12V ADJ
T1
POWER TRANSFORMER
※ WV-RC30/A,B:Brown
WV-RC30/C,G:Gray
White
Blue
Blue
C11 1000μF 25V
C10 2200μF 25V
C15 0.1μF
R11 680(1W)
R12 680
+S
+
-
-S
Y
X
V
W
IC1
IC2
VR1
VR2
VR3
VR4
VR6
VR46
SW5
CN1
CN3
CN13
CN14
CN19
CN20
CN22
CN26
TP1
TP2
TP3
TPG
CN43
INTERCOM
VR32
R PED PRESET
VR29
TOTAL PED PRESET
VR33
B PED PRESET
VR30
TOTAL PED
VR34
B PED
VR31
R PED
VR47
H PHASE
VR47
5K
SW3
AUTO/MANUAL
SELECTION
AUTO
MANUAL
SW2
AWC/ABC
SET
ABC
AWC
SW6
CABLE LENGTH
COMPENSATION
300m
200m
100m
50m
CAMERA
BAR
SW4
CAMERA/COLOR
BAR SELECTION
VR45
INTERCOM
LEVEL
VR45
1K
D22
TALLY
D21
POWER
SW1
POWER
5
6
7
8

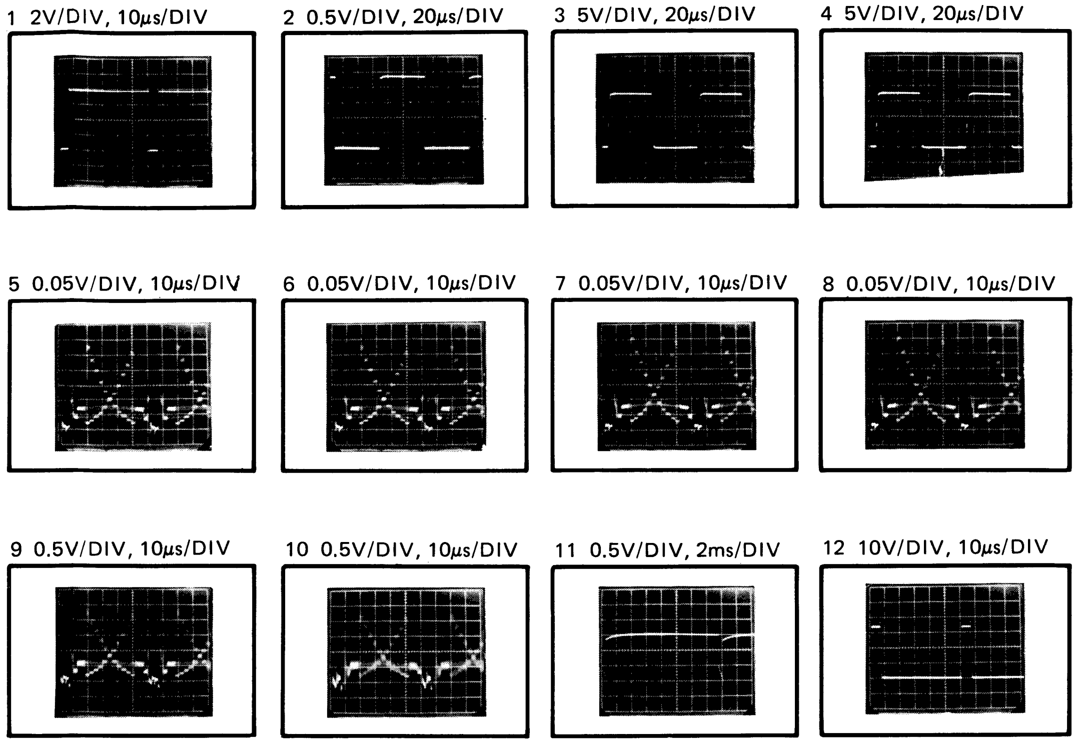
Q67	2SC828-RS	E3
Q68	2SC828-RS	E3
Q69	2SC828-RS	E3
Q70	2SC828-RS	E3
Q71	2SC828-RS	E3
Q72	2SC828-RS	E3
Q73	2SC828-RS	E3, F3
Q74	2SC828-RS	E3
Q75	2SC828-RS	E3, F3
Q76	2SA564-RS	E3
Q77	2SC828-RS	F3
Q78	2SC828-RS	F3
Q79	2SC828-RS	F3
Q80	2SC1317-RS	F3
Q81	2SC1317-RS	F3
Q82	2SC828-RS	D4
Q83	2SC828-RS	D4
Q84	2SC828-RS	D4
Q85	2SC828-RS	D4, E4
Q86	2SC828-RS	D4
Q87	2SC828-RS	D4
Q88	2SC828-RS	D4
Q89	2SC828-RS	E4
Q90	2SC828-RS	E4
Q91	2SC828-RS	E4
Q92	2SC828-RS	E4
Q93	2SC828-RS	E4
Q94	2SC828-RS	F5
Q95	2SC828-RS	F5
Q96	2SC828-RS	F5
Q97	2SC1317-RS	F5
Q98	2SC1317-RS	F5
Q99	2SC828-RS	F5
Q100	2SC828-RS	F5
Q101	2SA564-RS	D3
Q102	2SC828-RS	C3, D3
Q103	2SC828-RS	D6
Q104	2SC828-RS	D6
Q105	2SC828-RS	D5, D6
Q106	2SC828-RS	C6, D6
Q107	2SC828-RS	D5
Q108	2SC828-RS	F6
Q109	2SC828-RS	F6
Q110	2SC828-RS	F6
Q111	2SC828-RS	F6
Q112	2SC1317-RS	F6
Q113	2SC1317-RS	F6
Q114	2SC828-RS	E4
Q115	2SC828-RS	E4
Q116	2SC828-RS	E4
Q117	2SC1317-RS	E4
Q118	2SC1317-RS	E4
Q119	2SA838-BC	E4
Q120	2SC828-RS	D5
Q121	2SC828-RS	D2
Q122	2SC828-RS	D3
Q123	2SC828-RS	D4
D1	YUDXZ-080	C4
D2	XZ076	D2
D4	YUDXZ-080	E5
D7	MA150	E2, F2
D8	YUDXZ-080	F2
D11	MA150	E3, F3
D12	YUDXZ-080	F3
D15	YUDXZ-080	F5
D16	MA165	F5, F6
D17	MA165	F5, F6
D18	YUDXZ-080	F6
D19	YUDXZ-080	E4
D20	YWM4C51-13	E6

SCHEMATIC DIAGRAM OF HIGH VOLTAGE BOARD


HIGH VOLTAGE BOARD (YFVPKP77712A)
HIGH VOLTAGE
FEEDBACK BEAM CONTROL
-9V DC REGULATOR
CATHODE BLANKING
CN16
GND 1
B FBC IN 2
R FBC IN 3
G FBC IN 4
TARGET VOLTAGE OUT 5
TARGET PROTECTION IN 6
VS IN 7
HD IN 8
+9.0V IN 9
-9V OUT 10
+9V (STANDBY) IN 11
+40V OUT 12
L1 390μH
R1 15K
R2 1K
C1 1μF 50V
Q6
IC1
Q1
Q2
Q3
Q4
Q5
R3 2.2K
R4 470
R5 470
D1
D2
C2 10μF 16V
C3 10μF 16V
C4 100μF 16V
T1
R6 3.3K
C5 820PF 2KV
R7 1K
C6 1μF 250V
R8 560
D3
D4
D5
D6
D7
D8
D9
D10
C7 1μF 450V
C8 100μF 16V
C9 10μF 100V
C10 10μF 100V
C11 1μF 100V
C14 820PF 2KV
R12 100K
C15 0.022μF 1250V
R13 3.9M
R14 2.8M
R15 2M
R16 1M
R9 2.2M
R10 2.2M
R11 2.2M
VR1 1M
VR2 1M
VR3 1M
C12 1μF 100V
C13 1μF 100V
C16 1μF 100V
D11
D12
D13
VR1 R BEAM
VR2 G BEAM
VR3 B BEAM
VR4 2M
VR5 2M
VR6 2M
R17 100K
R18 100K
R19 100K
C17 0.1μF 200V
C18 0.1μF 200V
C19 0.1μF 200V
VR4 B FOCUS
VR5 G FOCUS
VR6 R FOCUS
R20 470K
R21 470K
R22 470K
960
460
300
135
-42
TP1
TP2
TP3
TP4
TP5
TP6
IC2
R GAMMA CORRECTION
G GAMMA CORRECTION
B GAMMA CORRECTION
VR7 R FBC LEVEL
VR8 G FBC LEVEL
VR9 B FBC LEVEL
VR7 10K
VR8 10K
VR9 10K
IC3
AMP
C24 100μF 10V
C25 100μF 16V
C26 100μF 16V
C27 47μF 16V
C39 47μF 16V
C40 22PF
C41 22PF
C42 22PF
R29 1K
C38 4.7μF 50V
R33 56K
D14
R26 3.3K
VR10 1K
R25 3.3K
C28 100μF 16V
C29 47μF 10V
R27 820
C36 0.47μF 50V
R28 47K
IC4
CATHODE BL MIX
HD
Vs
D15
R34 10K
C37 1μF 50V
C31 1μF 50V
C43 220PF
R32 470K
VR11 500K
R31 470K
C32 0.47μF 100V
C21 0.0033μF 200V
C22 0.0033μF 200V
C23 0.0033μF 200V
VR10 -9V ADJ.
VR11 TARGET
C30 4.7μF 50V
C
B
A
1
2
3
4
5


TUBE SOCKET BOARD
(YFVPKP77713A)
CN1
8
1
7
2
6
3
5
4
C1
0.022μF
1250V
R20
470K
R21
470K
R22
470K
960
B-G3,6
G-G3,6
R-G3,6
460
B-G5
G-G5
R-G5
300
B-G2
G-G2
R-G2
VR6
2M
R18
100K
R19
100K
C19
0.1μF
200V
TP3
TP2
TP1
TP4
135
R-G4
G-G4
B-G4
VR6
R FOCUS
CUS
-42
B-G1
G-G1
R-G1
B-H(-)
G-H(-)
R-H(-)
B-K
G-K
R-K
B-H
G-H
R-H
5
6

SIGNAL WAVEFORMS OF HIGH VOLTAGE BOARD


1 2V/DIV, 10μs/DIV

2 0.5V/DIV, 20μs/DIV

3 5V/DIV, 20μs/DIV

4 5V/DIV, 20μs/DIV

5 0.05V/DIV, 10μs/DIV

6 0.05V/DIV, 10μs/DIV

7 0.05V/DIV, 10μs/DIV

8 0.05V/DIV, 10μs/DIV

9 0.5V/DIV, 10μs/DIV

10 0.5V/DIV, 10μs/DIV

11 0.5V/DIV, 2ms/DIV

12 10V/DIV, 10μs/DIV

CONDUCTOR VIEW OF HIGH VOLTAGE BOARD

IC1	DN819	C2
IC2	EHMS727S40S	B2
IC3	EHMSU27W71S	A2
IC4	EHMSJ13W72	A3, A4

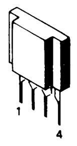
Q1	2SB641-RS	C2
Q2	2SA684-RS	C2
Q3	2SC1384-RS	C2
Q4	2SD636-RS	B3
Q5	2SB641-RS	A3
Q6	2SD636-RS	C2

D1	MA150	C2
D2	MA150	C2
D3	YUDERB12-02	C3
D4	YUDERB12-02	C3
D5	YUDERB12-02	C3
D6	YUDERB12-02	C3

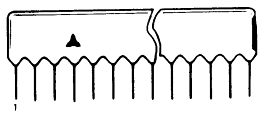
D7	YUDSIR60	C3
D8	YUDSIR60	C3
D9	YUDSIR150	C4
D10	YUDSIR150	C4
D11	MA162	C4
D12	MA162	C4

D13	MA162	C4
D14	YUD-XZ051	B3
D15	MA150	A3

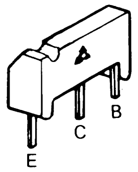
DN819



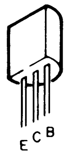
EHMSJ13W72
EMHS727S40S
EHMSU27W71S



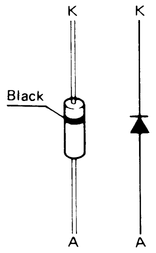
2SB641-RS
2SD636-RS



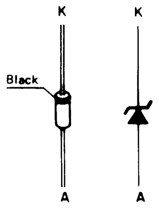
2SA684-RS
2SC1384-RS



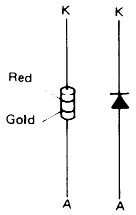
MA162



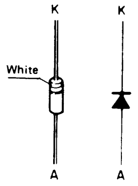
YUD-XZ051



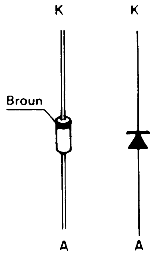
YUDSIR150



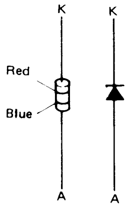
MA150



YUDERB12-02



YUDSIR60



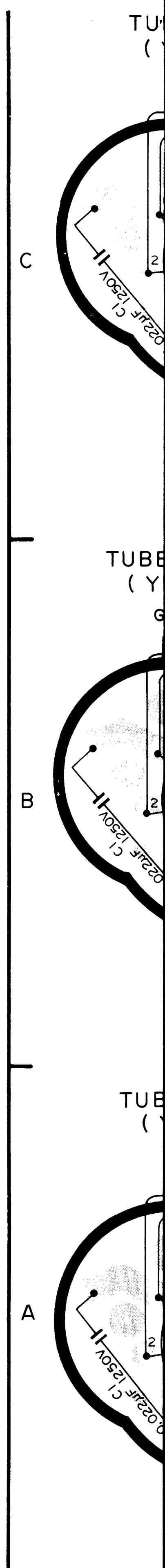
IC1	DN819	B4
IC2	EHMS727S40S	B3, B4
IC3	EHMSU27W71S	A2, A3, B2, B3
IC4	EHMSJ13W72	A4, B4

Q1	2SB641-RS	B4
Q2	2SA684-RS	B4
Q3	2SC1384-RS	B4
Q4	2SD636-RS	B4
Q5	2SB641-RS	B4
Q6	2SD636-RS	B4

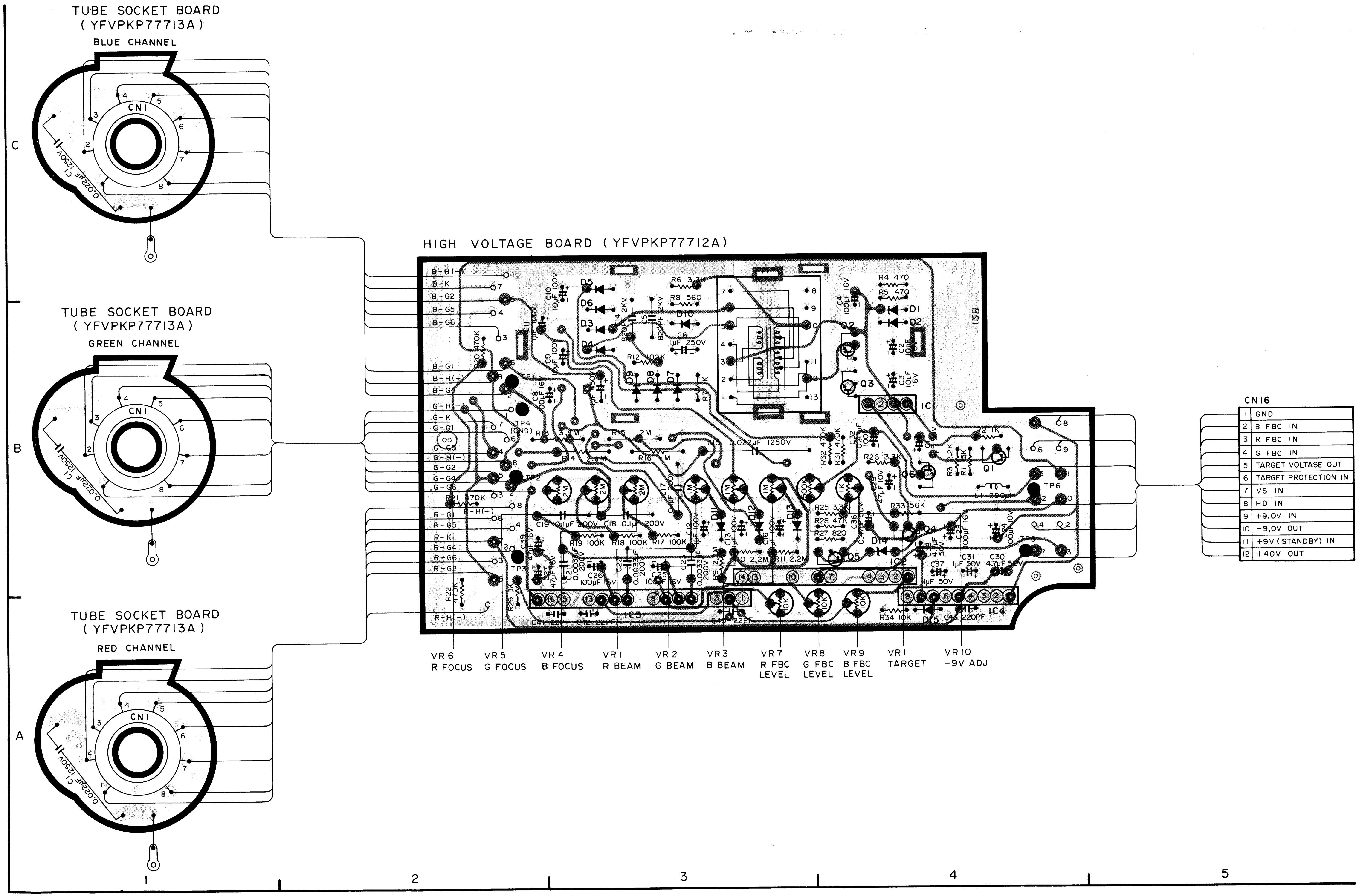
D1	MA150	B4
D2	MA150	B4
D3	YUDERB12-02	B3
D4	YUDERB12-02	B3
D5	YUDERB12-02	C3
D6	YUDERB12-02	B3

D7	YUDSIR60	B3
D8	YUDSIR60	B3
D9	YUDSIR150	B3
D10	YUDSIR150	B3
D11	MA162	B3
D12	MA162	B3

D13	MA162	B3
D14	YUD-XZ051	B4
D15	MA150	A4



CONDUCTOR VIEW OF HIGH VOLTAGE BOARD


TUBE SOCKET BOARD
(YFVPKP77713A)
BLUE CHANNEL
TUBE SOCKET BOARD
(YFVPKP77713A)
GREEN CHANNEL
TUBE SOCKET BOARD
(YFVPKP77713A)
RED CHANNEL
CN1
0.022μF C1 1250V
HIGH VOLTAGE BOARD (YFVPKP77712A)
B-H(-)
B-K
B-G2
B-G5
B-G6
B-G1
B-H(+)
B-G4
G-H(-)
G-K
G-G1
G-G5
G-H(+)
G-G2
G-G4
G-G6
R-G1
R-G5
R-K
R-G4
R-G6
R-G2
R-H(-)
R-H(+)
TP1
TP2
TP3
TP4 (GND)
TP5
TP6
IC1
IC2
IC3
IC4
Q1
Q2
Q3
Q4
Q5
Q6
L1 300μH
C15 0.022μF 1250V
VR 6
R FOCUS
VR 5
G FOCUS
VR 4
B FOCUS
VR 1
R BEAM
VR 2
G BEAM
VR 3
B BEAM
VR 7
R FBC
LEVEL
VR 8
G FBC
LEVEL
VR 9
B FBC
LEVEL
VR 11
TARGET
VR 10
-9V ADJ
CN16
1 GND
2 B FBC IN
3 R FBC IN
4 G FBC IN
5 TARGET VOLTAGE OUT
6 TARGET PROTECTION IN
7 VS IN
8 HD IN
9 +9.0V IN
10 -9.0V OUT
11 +9V (STANDBY) IN
12 +40V OUT
A
B
C
1
2
3
4
5

REPLACEMENT PARTS LIST

This replacement parts list only includes changed portion.

Impotant Notice

Component identified by * mark are new parts used from this model.

SYMBOL NO.	ORIGINAL PART NO.	NEW PART NO.	DESCRIPTION		
YFVPKP777F2A ENCODER BOARD					
R54	ERD10TJ151	**ERD10TJ820**	Carbon	82 ohms	1/8W
C52	————	**ECCF1H080DC**	Ceramic	8pF	50V
YFVPKP777F3A SYNC-1 BOARD					
R15	ERD10TJ154	**ERD10TJ823**	Carbon	82 Kohms	1/8W
YFVPKP777F6A DEFLECTION BOARD					
R76	ERO10CKF1502	**ERO10CKF3902**	Metal	39 Kohms	1/8W
R109	ERO10CKF2202	**ERO10CKF3902**	Metal	39 Kohms	1/8W
R116	ERO10CKF2202	**ERO10CKF3902**	Metal	39 Kohms	1/8W
R123	ERO10CKF1502	**ERO10CKF3092**	Metal	39 Kohms	1/8W
C51	ECSF16E3R3	**ECSF16E10**	Electrolytic	10μF	16V
YFVPKB0777FA MOTHER BOARD					
R58	ERD10TJ680	**ERD10TOT**	Jamper		
R69	ERD10TJ182	***ERD10TJ221**	Carbon	220 ohms	1/8W
R111	ERD10TJ273	**ERD10TJ183**	Carbon	18 Kohms	1/8W
R118	ERD10TJ152	**ERD10TJ102**	Carbon	1 Kohms	1/8W
R119	ERD10TJ272	**ERD10TJ122**	Carbon	1.2 Kohms	1/8W
C36	ECSF16E10	**ECSF6E33**	Electrolytic	33μF	6V
C37	ECSF16E10	————	———— Deleted ————		
C38	————	**ECSF16E10**	Electrolytic	10μF	16V
C39	————	**ECSF16E10**	Electrolytic	10μF	16V
C40	————	**ECCF1H030CC**	Ceramic	3pF	50V
YFVPKP77712A HIGH VOLTAGE BOARD					
R13	YFGS14375FB	***YFGS14285FB**	Metal	2.8 Mohms	1/4W
R14	YFGS14325FB	***YFGS14395FB**	Metal	3.9 Mohms	1/4W
R29	ERD10TJ682	**ERD10TJ102**	Carbon	1 Kohms	1/8W
WV-RC30 REMOTE CONTROL UNIT					
YFVPKP0030FA MAIN BOARD					
R99	ERD10TJ101	**ERD10TJ471**	Carbon	470 ohms	1/8W
R102	ERD10TJ821	**ERD10TJ182**	Carbon	1.8 Kohms	1/8W
R105	ERD10TJ182	**ERD10TJ103**	Carbon	10 Kohms	1/8W
CT1	————	**ECRBA090M12**	Trimmer		